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TOWARDS JUST URBAN GREENING

DEVELOPING A DIAGNOSTIC FRAMEWORK FOR COLLABORATIVE
URBAN PLANNING AS A MEANS FOR JUST URBAN GREENING
INITIATIVES IN AMSTERDAM – A CASE STUDY APPROACH

ABSTRACT

Urban greening is a climate adaptation strategy that tackles multiple social and environmental challenges in urban areas, two important ones being heat reduction and increased social wellbeing. Because of the positive social and environmental effects, it is important that urban greening takes a just and inclusive approach, with equal decision-making processes and recognition of existing inequalities, so that everyone can reap the benefits. Collaborative urban planning (CUP) is a governance strategy that takes an inclusive approach in urban planning practices and thus has the potential of providing a just output on urban greening. This research tries to further develop theory on environmental justice and urban greening, by critically scrutinizing collaborative urban greening initiatives through an environmental justice lens, which provides insights in how recognition, procedures and distribution play out. This has been done by taking an explorative multi case study approach. First, a literature research was conducted on urban greening, environmental justice and collaborative urban planning. This resulted in the development of an analytical framework, which was applied to three collaborative urban greening initiatives throughout Amsterdam by conducting semi-structured interviews, a document analysis and observation. A diagnostic framework was then developed based on theory and enriched with empirical findings of this research, through abductive reasoning. It aims to guide a focus of inquiry towards just urban greening, by asking critical diagnosing questions. It bridges theory to practice and is meant to guide practitioners towards just urban greening. The results stress the interconnectedness of the three environmental justice dimensions and reveal some important issues. CUP enhances quality (preservation) of the green spaces and awareness on the importance of urban greening. The identity and type of stakeholders is determined by structural inequalities, and what their priorities and intentions are, is important for just procedures and outcomes. Therefore, recognition should serve as a starting point for CUP to enhance just urban greening. Additionally, institutionalization of the three interconnected environmental justice dimensions in CUP is important. This research therefore concludes that collaborative urban planning enhances just outcomes of urban greening, often through just procedures. However, there is a need for increased recognition of existing inequalities and institutionalization to further pave the way towards just urban greening.

Keywords: urban greening, environmental justice, collaborative urban planning, diagnostic framework

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1. INTRODUCTION

Climate change increasingly affects people worldwide. The last decade has been the hottest ever measured in Europe (WMO, 2020). At the same time, urbanization occurs all over the globe; fifty percent of the worldwide population lives in cities now, which is expected to increase to seventy percent by 2050 (UN, 2018). Urban areas replace vegetated areas (Gill et al., 2007) and are referred to as 'heat islands' (Bowler et al., 2010; Gill et al., 2007), as temperatures are generally higher in cities than in rural areas. Consequences of climate change are already faced in cities causing social, economic and environmental damage. It is thus important to focus on climate change adaptation, to be able to sustain a good and healthy urban environment (Anguelovski et al., 2020; Davoudi, Crawford & Mehmood; 2009; Kabisch et al., 2016).

Urban greening, also referred to as green infrastructure, is a climate change adaptation strategy that tackles multiple social and environmental challenges in urban areas. Two important features are heat reduction and increasing social wellbeing, which are the focus of this research. By now, the effectiveness of urban greening as adaptation strategy to keep urban areas cool and therefore healthy and livable for all humans and animals living in it has become clear (Gil et al., 2007; Miller, Hauer & Werner, 2015; Oke, 1989; Wolch, Byrne & Newell, 2014). This having said, the social and spatial impacts of urban greening are understudied in literature, as the focus predominantly is on ecological benefits. However, the spatial socio-economic impacts have recently come to the attention (Dooling, 2009; Wolch et al, 2014; Anguelovski, 2016; Anguelovski et al., 2018; 2019; 2020 ; Chu, Anguelovski & Roberts, 2017; Gould & Lewis, 2016). Thus, because green infrastructure can have positive environmental and social effects on the city and its residents, both aspects, in terms of heat reduction and social wellbeing, are scrutinized in this research.

In line with SDG 11 *Inclusive cities*, Amsterdam's green vision 2050 (Wijten, 2020) and Climate Adaptation Strategy (Ivens, 2020), just urban greening is an important social, political and environmental challenge to tackle in the coming years. Because of the potential positive influence urban greening has on citizens' social and environmental wellbeing in cities, it is of crucial importance that all people living in a city can enjoy the benefits of green infrastructure. People of many different cultural backgrounds and socio-economic status live together in urban areas. They all have rights to enjoy the social, cultural and sustainable advantages of the city life. However, research in cities across the world has shown that green areas are not equally distributed among citizens and inequalities exist in participation patterns and decision-making procedures (Paavola & Adger, 2006). Examples are Greater Manchester, United Kingdom where "areas experiencing the highest surface temperatures and most socio-economic disadvantages also have the lowest tree population and here urban forestry initiatives" (Gill et al., 2007, p. 130); unequal canopy cover in relation to race and ethnicity within Milwaukee, United States (Heynen, Perkins & Roy, 2006); green renewal in Medellín, Colombia targeting tourists and wealthy residents and pushing away low-income residents (Chu et al., 2017) and a comparison between various US and Chinese cities revealing that "the distribution of such (*green*) space often disproportionately benefits predominantly white and more affluent communities (Wolch et al., 2014, p. 234). This is problematic because climate change adaptation in cities is meant to be just and inclusive (Adger et al., 2011; Archer et al., 2014; Bulkeley 2010; Bulkeley, Edwards & Fuller, 2014; Hughes, 2013) considering vulnerable groups, communities and ecosystems (UNFCCC, n.d.). Therefore, when addressing climate change adaptation, questions on environmental justice have to be raised.

Environmental justice has various interconnected dimensions. Not only is there a need for achieving equal distribution of benefits green spaces provide, to examine whether costs and benefits are equally distributed among urban dwellers (Anguelovski et al., 2019; Bulkeley et al., 2014; Edwards & Fuller, 2014; Schlosberg, 2013). We must also consider procedural justice and recognition. Procedural justice indicates equal procedures in the form of equal participation and representation in political decision-making processes (Fraser, 2008). Recognition emphasizes socio-economic and cultural differences and especially brings attention to the more vulnerable in the city by acknowledging existing social, economic, political and cultural inequalities (Anguelovski et al., 2019; Bulkeley, et al., 2014; Fraser, 1997; Schlosberg, 2013). Recognition is therefore an important outset in exploring distribution and procedures (Bulkeley, et al., 2014).

Research on environmental justice deficiencies in climate adaptation in cities has evolved over the last years, however, knowing how to intervene to improve this can be very challenging. Hence, there is need for research expanding the theories, designs and empirical materials, so that socio-spatial dynamics of urban greening can be understood (Anguelovksi et al., 2018) and all citizens will be able to enjoy the benefits of the green infrastructure. Collaborative urban planning (CUP) (Emerson et al., 2011; Healey, 1997) is a governance strategy that takes an inclusive approach, which constructively engages all people involved in (urban) planning practices and thus has the potential of providing a just output on urban greening. The importance of collaboration between different stakeholders in urban planning and climate change adaptation, including urban greening, has been addressed before (Archer et al., 2014; Brink & Wamsler, 2018; Chu et al., 2017). However, the connection between such approaches and more just outcomes and procedures or addressing structural inequality has not yet been proven. By critically assessing collaborative urban greening initiatives through an environmental justice lens, it can be scrutinized whether and how collaborative urban greening has the potential to tackle inequalities of distribution, representation and misrecognition in cities and create "equitable, healthy, transformative urban arenas and addressing long-standing racial, ethnic, and class inequalities in cities around the world" (Anguelovksi et al., 2018, p.1080).

To be able to inquire how just urban greening can be enhanced in collaborative greening initiatives, a diagnostic framework is developed. Diagnostic approaches are developed across scholars (Garick et al., 2013; Hinkel & Bosaro, 2016; Ostrom, 2007; Pahl-Wostl, 2009) and "serve to support structured, context-specific, critical diagnostic inquiry" (De Loë & Patterson, 2017, P.566). The framework guides the right questions and focus of enquiry towards just urban greening, by critically scrutinizing collaborative urban planning through an environmental justice lens. By doing this, future governance of urban greening initiatives can be executed in way that enhances just urban greening.

1.1 Research aim and research questions

The overall aim of this research is to contribute to existing theory and empirical findings on environmental justice in the context of urban greening, by providing insights into how collaborative urban planning can enhance just urban greening. This is addressed through the following research questions (RQ):

How can collaborative urban planning enhance more just urban greening in Amsterdam?

To be able to answer this research question, it is substantiated by the following sub questions:

SQ1. How can environmental justice in the context of urban greening be defined and conceptualized?
   a) *How can urban greening be defined and conceptualized?*
   b) *How can environmental justice be defined and conceptualized?*

SQ2. How do selected collaborative urban greening initiatives in Amsterdam perform in the enhancement of just urban greening?

SQ3. How can environmental justice in the context of urban greening be inquired through developing a diagnostic framework?

A literature research provided insight on environmental justice and urban greening planning (SQ1[1]). This first step resulted in the development of an analytical framework, which is applied to three collaborative urban greening initiatives in Amsterdam (SQ2). The resulting empirical findings iteratively led to development of the analytical framework into the diagnostic framework, which continued to be a subject of change until the end of the case study research. After the case study's, the main empirical findings were briefly compared and contextualized against existing literature in the discussion and the diagnostic framework was finalized (SQ3). Finally, conclusions on just urban greening enhanced by collaborative urban planning are derived.

1.2 Research Framework

The research framework is depicted below in Figure 1. It schematically represents the research objectives and includes appropriate steps that need to be taken to achieve it, in accordance with the sub questions.

FIGURE 1 RESEARCH FRAMEWORK

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[1] Refers to the corresponding steps of the research as depicted in Figure 1 Research Framework

1.3 Scientific relevance

This study is relevant to Sustainable Development research because it contributes to the current body of literature on environmental justice in the context of (collaborative) urban greening, by critically scrutinizing collaborative urban greening initiatives through an environmental justice lens which provides insights in how recognition, procedures and distribution play out in collaborative urban planning. It gives close attention to social diversity and the implications for urban greening. Combining the literature with the empirical findings leads to the creation of a diagnostic framework, which contributes to the currently understudied science in the field of environmental justice in the context of collaborative urban greening, because it guides right questions and focus of enquiry to stimulate just outcomes in urban greening. The framework contributes to an understanding of socio-spatial dynamics of urban greening and provides possible pathways forward. Scrutinizing this for the case of Amsterdam contributes towards a better understanding how to intervene to improve justice deficiencies of urban greening in other Western cities with similar governance structures. It thus contributes to an empirical and problem based perspective.

1.4 Societal relevance

This research provides insights in how collaborative urban greening initiatives contribute to a more just and greener city and makes recommendations on ways to move forward in making these initiatives practices more just, by scrutinizing three collaborative urban greening initiatives and developing a diagnostic framework that serves to guide an inquiry towards just urban greening. From 2021 onwards, De Gezonde Stad (DGS), by whom this research is commissioned, aims to focus more on inclusiveness and accessibility, making Amsterdam healthy and livable for all citizens (De Gezonde Stad, 2020a). This research contributes to their ambitions and just urban greening in the city because it paves the way towards more just greening initiatives on locations where greening is most urgently needed. These outcomes can be used to develop action plans which map how greening can benefit all people, and preferably those who need it most. This is important as cities throughout the world are segregated and environmental burdens and benefits are not equally distributed among urban dwellers, nor have (marginalized) people equal access to procedures (Paavola & Adger, 2006). There is a need for guidance frameworks (Breukers & Jeuken, 2017), because by critically inquiring environmental (in)justices and guiding towards asking the right questions, practitioners know how to act to improve this in the future. By doing this, the urban population is able enjoy the benefits of urban greening and minimize the burdens of the increasingly felt consequences of climate change.

1.5 Outline of the report

The report is structured as follows. First, chapter 2 answers sub question 1 by defining and conceptualizing relevant theories and approaches, which are brought together in a conceptual framework and translated into an analytical framework. Then, chapter 3 provides the research methodology employed to collect and process theoretical and empirical data and results, which serve to answer the research question. In chapter 4, the case study background of Amsterdam as well as the specific neighborhoods and selected cases is presented, to provide background information. Chapter 5, 6 and 7 in turn show the results of the case study research. These results are briefly compared, contextualized against literature and brought together in a diagnostic

framework in the discussion in chapter 8, which answers sub-questions 2 and 3. The limitations as well as suggestions for further research are also provided here. Finally, in chapter 9, conclusions are derived, which answers the main research question.

2. THEORETICAL FRAMEWORK

Relevant theories and approaches are defined and conceptualized (2.1): Urban greening (2.1.1) and environmental justice (2.1.2) and collaborative urban planning (2.1.3) is also elaborated on. These are brought together in a conceptual framework (2.1.4). This is translated into an analytical framework (2.2).

2.1 Relevant theories and approaches

2.1.1 Urban Greening

Urban greening provides a connection between the city and nature (Bilgili & Gökyer, 2012). It is defined as an integrated, city-wide approach to the planting, care and management of all vegetation in a city to secure multiple environmental and social benefits for urban dwellers (Miller et al., 2015). Urban greening inquiry originates in studies on leisure of urban dwellers in nature (Nash, 1967), which moved onto critical views on green space as key to unlocking culture, identity and leisure (Fischer, 2015). Increased spare time for urban residents increased their demands for green space. It has thus become increasingly important that urban greening is present and of good quality, so that it can be enjoyed by all who live in cities (Bilgili & Gökyer, 2012; Fischer, 2015).

Urban greening is one of the most promising opportunities for urban climate change adaptation and increases social welfare and health of urban dwellers. Green infrastructure can provide critical ecosystem services: it decreases local temperatures (Bowler et al., 2010 etc etc); intercepts, stores and infiltrates (rain)water (Gil et al., 2007) and mitigates air, water and noise pollutions (Wolch et al., 2014). Trees cool the atmosphere by providing shade, thereby preventing the land surface from warming (Oke, 1989). Built surfaces do not provide these functions, causing increased surface runoff of rainwater and higher local temperatures (Gill et al., 2007).

Next to urban greening as effective strategy for climate change adaptation, it also plays a crucial social role in cities by making the urban population feel more connected to nature (Whitburn, Linklater & Milfont, 2019) and increases their mental and physical health and wellbeing (Schicklinski, 2017). More green surface in the neighborhood leads to a higher life expectancy (Jonker et al., 2014) because of the potential to mitigate air quality and temperatures (Nieuwenhuijsen, 2016). Additionally, people who live in a green environment suffer less from anxiety disorders and depression (Haase et al, 2017).

In this thesis, the focus is on social wellbeing and heat reduction. Combining an environmental and a social element of urban greening is interesting from a sustainability aspect because it comes closer to an integral perspective on the benefits of greening. As there are numerous benefits of urban greening, as mentioned above, a choice for two of them is made to fit it in the scope of this research. Stuiver et al. (2020) have identified seven reasons to green a city, of which heat reduction and social cohesion are two important ones.

First, heat reduction is an important aspect of urban greening because of the high probability of increasing long-term average temperatures and the already increasingly frequent intensity and duration of heat-related events, including heatwaves under climate change (IPCC, 2019). Green

spaces can locally cool down the atmosphere because of water evaporation and trees cause shade, which causes people to experience less heat during hot days (Bowler et al., 2010; Stuiver et al., 2020; Yin et al., 2018). Not only does it increase the living environment, it also decreases air-conditioning use and therefore energy use. Additionally, labor productivity lowers during hot days and there are negative consequences for infrastructure and water quality (Stuiver et al., 2021). However, not all types of green infrastructure reduce the same amount of heat. Trees reduce heat better than lower types of green and quality, diversity and enough space to grow matter (Hiemstra, 2019).

Second, urban green contributes to social wellbeing. The importance of urban green for social wellbeing increases along the line of the degree of urbanization. The more urbanized a neighborhood is, the more important green spaces are for social cohesion. This is mostly because it contributes to the amount of meeting places in the neighborhood (Vreke, Salverda & Langers, 2010). Additionally, green provides a place to relax and relieve stress (Bos & Vogelzang, 2018; Hennen & Mattijssen, 2020; Stuiver et al., 2020; Wolch et al., 2014).

Because of the positive distributive effects of green infrastructure, equal inclusion in procedures and recognition of socio-economic and cultural differences is of great importance, so that everyone can enjoy the benefits. Especially the underprivileged, often living in small, badly insulated houses without garden and facing social difficulties. Therefore, urban greening will be looked at from an environmental justice perspective in this research.

2.1.2 Environmental Justice

Environmental justice originates from the environmental racism movement, which started in the 1980's in Warren County, USA after contaminated soil was dumped into a river with predominantly people of color living surrounding it. This was the start of the social movement surrounding (un)equal distributions of environmental risks by race and class (Mohai, Pellow & Robetrts, 2009). Environmental justice has been defined in terms of rights "all people and communities are entitled to equal protection of environmental and public health laws and regulations." (Bullard, 1994). The U.S. Institute of Medicine (1999) defined it as "The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." Environmental justice addresses societies' basic structure and the regulation of social, economic and environmental equality and is often conceptualized in three distinct but interconnected pillars: distribution, procedures and recognition.

Distributional justice is the most traditional framing of environmental justice and refers to the extent to which costs and benefits of social cooperation are equally distributed (Rawls, 1971). It concerns both social and material costs and benefits and equal distribution among people over time and space (Shi et al., 2016). This is in line with distribution in terms of rights and responsibilities, indicating who has the right to act and the responsibility (to deal with the consequences) of these actions (Bulkeley et al., 2014). This fair distribution of costs and benefits, however, cannot be accomplished without considering procedural justice and recognition.

Procedural justice deals with democratic, fair and equitable political and decision-making processes (Schlosberg, 2007). Equal representation of different groups in society facilitates

environmentally just decisions as it gives them a voice to speak for themselves. Fraser (2008) refers to misrepresentation as "political voicelessness.". Procedural justice therefore convert recognition into political participation practices (Schlosberg, 2012). "Who should take decisions over what, by what means and on whose behalf" (Bulkeley et al., 2013, p 917) and how to make these processes transparent and legitimate.

Recognition concerns what underlies justice deficiencies because of structural maldistribution and how social, economic, political and cultural structures in society lead to this (Fraser, 1995; 1997; 2008; Schlosberg, 2013; Young, 1990). It stresses the importance of taking inequalities from the past into account when looking at societal, economic and environmental issues. It is therefore about deconstructive and affirmative practices, bringing attention to the vulnerable and the way their status is constructed (Fraser, 1997). It is a key condition for distributive and procedural justice (Schlosberg, 2012), because issues like stereotyping and subordinating cultures and socio-economic marginalization and deprivation result in unjust procedures and distribution of environmental benefits. Problems of misrecognition are often solved as problems of maldistribution (Fraser, 1995). However, recognition shifts the focus from prevention, mitigation and cost distribution, to the "very real and growing effects and climate change on the ground" (Schlosberg, 2013, p. 446). It includes the acknowledgement of differences, exploring these with a multi-scalar lens and analyzing inequalities of institutions, systems and processes of power (Malin & Ryder, 2018; Pellow, 2016).

There is a need for a shift from inquiring environmental justice on a global scale to examining how environmental justice is being pursued on the city level. Climate justice on the city scale is important to address because climate change is being produced through the city, which both reproduces and challenges existing forms of development and urban inequality (Bulkeley et al., 2014). Distribution in the city displays inequalities of costs and benefits of environmental risks and adaptation strategies. Procedural justice deals with (un)equal local policies and decision-making processes in the urban arena. Recognition in cities takes the step from shared responsibilities towards addressing needs of marginalized areas and groups of people. The three dimensions are interconnected, and one cannot be addressed without the other, in enquiring environmental justice on the city level.

2.1.3 Collaborative Urban Planning

The concepts of environmental justice and urban greening are analyzed applied to collaborative urban greening initiatives (see Figure 2 for conceptual framework), which is why collaborative urban planning (CUP) is shortly elaborated on here.

CUP is a way of managing co-existence in shared places of local environments, which has followed from critiques on top-down planning regimes and moves towards a public realm where political communities collaborate (Healey, 1997). Communities in cities are diverse, with people from different cultures and socio-economic backgrounds. Meeting their different needs and wants asks for pluralistic, democratic and collaborative governance approaches rather than top-down government interventions. CUP practices address and act upon these different approaches, shaping the environment in a way that serves all.

Looking at planning as a "policy- driven, coordinative, knowledge-rich and future-oriented approach to governance processes" (Emerson, p.231), taken together with a collaborative approach combines policy measures with consensus-building and inclusive reasoning and construction of rights with respect to the process. It takes place within a public realm which shapes the planning dynamics and practices by both formal rules and regulations as well as social and cultural norms and values (Emerson et al., 2011; Healey, 1997).

2.1.4 Conceptual Framework

The relevant theories and approaches of this research are conceptualized in a conceptual framework in Figure 2 below. The three interconnected pillars of environmental justice play out in the context of urban greening. CUP takes in a dual role because it is seen as the potential driver of just urban greening in all its three dimensions, but it also comes in very specifically to procedural justice. CUP is therefore considered in all three dimensions of justice, which are connected, but specifically operationalized in terms of procedures. This is not to suggest a linear view, but as a starting point for analysis, because CUP is expected to influence and potentially enhance just urban greening, but how and in what ways is under study. The theories and approaches are applied to collaborative urban greening initiatives in this research.

FIGURE 2 CONCEPTUAL FRAMEWORK

2.2 Analytical Framework

The conceptual framework is operationalized in the analytical framework depicted in Table 1, providing measures and indicators of the dimensions of environmental justice in the context of urban greening. The rationale of the analytical framework starts with the three interconnected dimensions of environmental justice: distribution, procedures and recognition. The operationalization of variables, i.e. the formulation of indicators is based on different bodies of literature for each dimension. As mentioned before, CUP is considered in all three dimensions of justice but specifically operationalized in terms of procedures.

The inquired distributive functions of green within the scope of this research are heat reduction and social wellbeing. Firstly, heat reduction is conceptualized in the presence of trees and water. Both trees and water cause people to experience less heat - trees because they provide shade; water because it provides refreshment on hot days (Stuiver etl al., 2020). Additionally, whether the green space is cooler than its surroundings is assessed. Secondly, influence on social wellbeing is defined in the green infrastructure serving as a place for relaxation, social meeting place and stress relieve (Hennen & Mattijssen, 2020). Additionally, the quality of the greenery is assessed, because green infrastructure only has positive distributive effects in terms of social wellbeing, when it is in good condition (Anguelovksi, 2018; Hennen & Mattijssen, 2020). If and how CUP enhances these distributional outcomes is considered.

In this thesis, procedural justice is constructed by the collaboration dynamics of Emerson et al. (2011). The collaboration framework takes a relatively holistic approach on procedural justice rather than only focusing on prescriptive processes. It addresses the collaboration dynamics of principled engagement shared motivation and capacity for joint action. Principled engagement starts with the notion of including all relevant stakeholders in the decision-making processes, indicating all people and parties to whom what is to be decided will occur. From here, the inclusiveness in interaction and iteration of discovery, definition, deliberation, and determination is assessed. Discovery identifies shared interests; definition processes define shared purposes and objectives; deliberation resolutes conflicts and ensures advocacy of (individual and represented) interests; and through joint determination procedural and substantive agreements are reached. Shared motivation reinforces or accelerates principled engagement, as it stresses the importance of interpersonal and relational elements of CUP. Shared motivation consists of trust, mutual understanding, legitimacy and commitment. For this research legitimacy and commitment are used as indicators for shared motivation, considering that legitimacy is created by trust and mutual understanding of the participants of CUP. Legitimacy in its turn creates bonds of shared commitment. Because of the environmental justice lens, shared motivation should be present among all relevant stakeholders, defined in principled engagement (Emerson et al., 2011). Capacity for joint action has the purpose to "generate desired outcomes, by taking effective action, that could not be accomplished separately" (Emerson et al., 2011, pp 14). From an procedural justice perspective, it entails the presence of equal procedural and institutional arrangements, and equal access to and use of leadership roles, shared knowledge and sufficient resources in terms of budget, time, skills, assistance and support (Emerson et al, 2011).

Assuming that recognition is about needs, wants and concerns of different groups and people, Fraser (1997) distinguishes between socio-economic and cultural injustice. The first is rooted in the political-economic structure of society and exemplified by exploitation, economic marginalization and deprivation. Cultural injustices are rooted in social patterns of interpretation, representation and communication. Examples are cultural domination, nonrecognition and disrespect. The research takes upon this approach in this research, and argue the different needs, wants and concerns must first be acknowledged and then be anticipated on, for CUP initiatives to enhance just outcomes. Noteworthy is that cultural and socio-economic are taken apart but are of course intertwined. To be able to overcome these socio-economic and cultural injustices, processes underlying exclusion should be tackled (Schlosberg, 2012). Additionally, Schlosberg (2007) argues justice should include admission for those who have interests. It can be assumed that urban dwellers all have interests in accessing urban green,

considering the positive distributional effects. It is therefore important that everyone feels welcome in the green space. Thus, if and how CUP enhances the acknowledgement and anticipation of cultural and socio-economic needs and wants, as well as tackling the processes underlying exclusion (structural inequalities) and everyone to feel welcome is scrutinized.

TABLE 1 ANALYTICAL FRAMEWORK

VARIABLE	MEASURE	INDICATOR
Distribution	Less heat stress	Trees present to provide shade
		Presence of water
		Cooler temperatures than surroundings
	More wellbeing	Good quality of the green space
		Relaxation
		Social meeting place
		Stress relieve
Procedures	Principled engagement	In- exclusion of all relevant voices
		(In- exclusion in) Iteration of discovery, definition, deliberation, determination
	Shared motivation	Mutual understanding and trust → legitimacy
		All relevant stakeholders feel commitment to the initiative
	Capacity for joint action	Existence of procedural and institutional arrangements
		Participants have equal access to knowledge, resources and leadership
Recognition	Recognition of different cultural and socio-economic needs, wants and concerns	Cultural needs, wants and concerns are acknowledged and anticipated on
		Socio-economic needs, wants and concerns are acknowledged and anticipated on
		Processes underlying exclusion are tried to be tackled
		Everyone feels welcome in the green space

3. RESEARCH METHODOLOGY

This chapter provides an overview of the research methodology. First, research strategies and outputs are elaborated on (3.1). Then, the research material and sources are presented (3.2), followed by the data collection and processing methods (3.3) and ethical considerations (3.4).

3.1 Research strategies and outputs

To answer the research question, this study used two research strategies: desk research (3.1.1) and a multiple case study on urban greening initiatives in Amsterdam (3.1.2), which led to the development of a diagnostic framework (3.1.3). Hence, the research is qualitative in nature. It started off with a desk research on the theories and approaches, and continued with empirical research, which was the main strategy of this research.

3.1.1 Desk research

Desk research on existing bodies of literature and secondary data of the selected cases provided first understandings on the topic and variables under study. A literature survey on environmental justice and urban greening provided a starting point from which the empirical study is conducted. A critical reflection on existing material answers sub-question 1 *How can environmental justice in the context of urban greening be defined and conceptualized?* and is presented in an analytical framework, which provides a basis for a preliminary diagnostic framework development.

Additionally, desk research on (the distribution of) green infrastructure in Amsterdam is conducted, in order create a profound basis to start the case study research. This is district specific and based on maps and demographics provided by the municipality of Amsterdam. Additionally, secondary data on the urban greening initiatives is retrieved to gain a better understanding of the cases.

3.1.2 Case Study Design

The predominant research strategy of this study is a case study analysis, defined by Gerring (2004) as "an intensive study of a unit with an aim to generalize across a larger set of units' (p. 341)". This research is an exploratory multiple case study, studying three cases: *Greening Lambertus Zijlplein (LZP), Zeeburgertuin (ZBT), and Het Eetbare Plantsoen Zeeburgertuin* (HEP). Trying to understand these complex phenomena, the study aims to gain understanding of the cases in a broader way, meaning that it tried to provide insights applicable to other collaborative urban greening initiatives. Environmental justice is the phenomenon that is explained, which makes it the output or dependent variable of this research. Collaborative urban planning is suspected to influence this and indicates the independent variable. The various aspects of CUP manifested in collaborative urban greening initiatives (the unit of analysis) are expected to have the same effect on environmental justice, making this multiple case study research a most different case research design (Burnham et al., 2008).

This study uses an exploratory multiple case study method (Yin, 2009; Stewart, 2012) that tries to explore how CUP might enhance just urban greening. It considers that not all, probably varied, outcomes must be related to CUP and enhance just urban greening. It "allows the researcher to take a question, usually based on a practical issue, and to pursue the relationships that underlie

it" (Stewart, 2012, p 75). A brief comparison between the cases is executed to reveal important differences and overlaps.

The cases are strategically selected, based on several characteristics and requirements. First, all initiatives green the city and are collaborative of nature. Second, cases are selected throughout the city of Amsterdam, to be able to provide an overview into the various districts with different aspects. Third, the planning and enactment of initiatives is between 2015 - 2021, so that recent data is available and the stakeholders have the initiative clear in mind. Fourth, two out of three of the cases involve DGS, but are not necessarily initiated by them. Fifth, the initiatives are in line with the *Groenvisie* 2050 of the municipality of Amsterdam. Sixth, the initiatives should be publicly accessible. Seventh, the cases are selected based on data availability.

An overview of the cases is provided below in Table 2 and their locations in Amsterdam is depicted in Figure 3. Lambertus Zijlplein (LZP) is an interesting case because it occurs in the multicultural district of Nieuw-West and the local citizens are, even though it is a municipality-initiated initiative, actively tried to be included. Zeeburgertuin (ZBT) is located on the other side of the city, in the Eastern part. ZBT is interesting to scrutinize because it is executed in close collaboration with a real estate company and the high level of citizen participation. Het Eetbare Plantsoen (HEP) is an interesting case because it is initiated and entirely run by citizen(s), with a very dominant role for the initiating citizen. Additionally, it is situated in a relatively poor and multi-cultural neighborhood in the center-west side of the city. The three cases are different, though collaborative in nature, and located throughout the city, as depicted in Figure 3. This makes them interesting cases together, as it shows different aspects of CUP and if and how these enhance just urban greening. Analyzing the cases answers sub-question 2 *How do selected collaborative urban greening initiatives in Amsterdam perform in the enhancement of just urban greening?*

In this research just urban greening is defined and conceptualized as urban greening with positive environmental and social effects in terms of heat reduction and social wellbeing, through just (collaborative) procedures in which all relevant stakeholders are represented, mutually understood and equally engaged in joint action and through recognition of existing inequalities, by addressing different socio-economic and cultural needs, wants and concerns. How the initiatives perform in the enhancement of just urban greening is in different indicators is indicated with "--" (does not enhance just urban greening), "-" (barely enhances just urban greening), "+" (enhances just urban greening), or "++" (enhances just urban greening considerably).

TABLE 2 THE CASES

CASE NUMBER	CASE	INITIATOR	DISTRICT	TIME
1.	*Lambertus Zijlplein vergroening (LZP)*	Municipality & DGS	Nieuw-West	2019-2021
2.	Zeeburgertuin (ZBT)	Citizens, DGS, ASR real estate, municipality	Oost	2018-2020
3.	Het Eetbare Plantsoen (HEP)	Citizens	West	2015-2020

Legend

		Types of green
■	☑	City Park
■	☑	Rough area/strolling nature
■	☑	Urban fringe polder
■	☑	Corridor
■	☑	Allotment Park
■	☑	Sports park
■	☑	Cementry
■	☑	Curiosities

FIGURE 3 MAIN GREEN STRUCTRE AMSTERDAM WITH THE CASES (MUNICIPALITY OF AMSTERDAM, 2020A)

3.1.3   Diagnostic framework development

The diagnostic framework is an output that needs further elaboration, which is provided here. Diagnostic approaches are developed across scholars (Hinkel et al., 2015; Hinkel & Bisaro, 2016; Ostrom, 2007; Pahl-Wostl, 2009) and "serve to support structured, context-specific, critical diagnostic inquiry" (De Loë & Patterson, 2017, P.566). The development of a diagnostic framework is a structured process of context specific inquiry into the environmental and social aspects of environmental justice in the context of urban greening. It aims to identify and diagnose factors systemically and strategically. It takes a critical approach on environmental justice in the context of urban greening. Combining this with empirical evidence prevents 'blind spots' from occurring (Garrick et al. 2013). The framework is developed through flexible and context specific analysis without being case specific and not transferable (Ostrom, 2007; Pahl-Wostl, 2009). This is assured because the framework is based on literature and developed through critically scrutinizing three cases in which specific attention is paid to recurring patterns. By doing this, the diagnostic framework aims to contribute to find ways towards just urban greening by making it able to identify realistic and feasible strategies to move forward (Young, 2008). Elucidating just urban greening asks for a framework of intermediate complexity. Too much complexity will make the framework to case specific; a too generic and simplistic approach undermines the complexity of environmental justice in the context of urban greening (Pahl-Wostl, 2009).

Put to practice, first an analytical framework is developed by the identification of important factors of environmental justice, urban greening and CUP, based on the literature survey. This is applied to the various collaborative urban greening initiatives in Amsterdam. During this process, iterative critical reflection prevented a tunnel vision from happening through abductive reasoning. Abduction is an ongoing process, inventing an explanatory plausible hypothesis based on theory, that is subject to change during the research process, because of the enrichment of contextual findings (Walton, 2014). This type of reasoning indicates that the expectation that CUP enhances just environmental greening is nonlinear and how this happens has become clear through the initiatives under study. After conduction of the case study's, analysis of all the data resulted in identifying how CUP in both development and outcome of urban greening initiatives enhances just urban greening. The main empirical findings are combined with the analytical framework and translated into a diagnostic framework with diagnosing questions. Descriptive answers, enriched with examples (in the form of footnotes), are provided to guide the user[2] in answering the questions. These answers are not set in stone but guide in understanding the possibilities towards just urban greening. The answers are categorized into: 'does not enhance just urban greening', 'barely enhances just urban greening', 'enhances just urban greening' and 'enhances just urban greening considerably'. These categories exemplify the nonlinear relation between CUP and just urban greening and do not refer to the effectiveness or success of the initiative, but to the environmental justness. The development of the framework contributes to a better understanding of how to move forward to increase environmental justice in collaborative urban greening initiatives and will answer sub-question 3 *How can environmental justice in the context of urban greening be scrutinized through developing a diagnostic framework*?

3.2 Research material and sources

The objects of research define the research population and are in this research categorized under stakeholders, initiatives and theory. The various sources can have data gathering, data collecting and data generating functions. Second, the type of information on these objects has to be identified. Objects of research can provide two types of information: data and/or knowledge. Data provides an insight into the characteristics of the research objects. Knowledge exists of already existent insights or theories. Identified sources of information are individual people (P) (respondent (r), informant (i) or expert (e)), media (M), real life (R), documents (D) and literature (L). Third, how and where this information can be generated should be known. Methods used for assessing sources are questioning (Q), observation (O), content analysis (CA) and search methods (SM) (Verschuren & Doorewaard, 2010). Ethical considerations are considered for all methods, especially for the interviews and observation. Approval for observation, questioning and possible recording is always asked in advance. For this research, all the above has been identified in the following Table 3.

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[2] The user can be the initiator of the collaborative urban greening initiative or other interested parties within the fields of urban greening and environmental justice, such as policy makers, researchers, organizations and citizens

TABLE 3 RESEARCH MATERIAL

OBJECTS OF RESEARCH		TYPE OF INFORMATION					DATA COLLECTION			
		P	M	R	D	L	Q	O	CA	SM
Stakeholders	Municipality	i, r	x		x	x	x		x	x
	Private stakeholders	i, r					x		x	x
	Greening organizations (DGS, HEP)	i, r	x		x	x	x	x	x	x
	Social & community organizations	i, r	x				x			x
	Citizens	i, r					x		x	x
Initiatives	LZP	i, r	x	x	x		x	x	x	x
	ZBT	i, r	x	x	x		x	x	x	x
	HEP	i, r	x	x	x		x	x	x	x
Theory	Urban greening	e	x	x	x	x	x		x	x
	Environmental justice	e	x	x	x	x	x		x	x

3.3 Data collection and processing

Triangulations of methods and sources is done to achieve depth on the studied phenomena (Mason, 2018; Verschuren & Doorewaard, 2010), by doing in depth qualitative interviews, participant observation and content analysis.

Questioning (Q) is via interviews. Through interviews in depth situational, contextual and interactional knowledge is generated, which cannot be generated in any other form (Mason, 2018). Interviews with the civil servants of the municipality, project leaders, local organizations and residents were semi-structured and open, since some specific data on the variables is needed, but free interpretation and the possibility to elaborate can provide new insights[3]. The interviewees were selected through a stakeholder analysis and snowball sampling. They read the project information and gave their written informed consent. Interviews were conducted face-to-face where possible and otherwise (because of Covid-19 or other reasons) through online meetings or telephone. Interviews are analyzed in a qualitative way using NVivo. NVivo is useful in categorizing, structuring and coding interviews. A hierarchical coding frame is applied to the data. The coding frame is deducted from literature, in line with the analytical framework and enriched with codes from empirical findings.[4] Additionally, conversations with and questions to fellow researchers who have been encountered throughout the research have helped to the understanding of the theories.

Observation (O) of the initiatives is done by visiting the green locations in the city, to get a grasp on the situation. Additionally, observation took place via participation in assemblies and meetings with stakeholders of the initiatives, including a meeting with investors of ZBT, a residents

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[3] See Appendix B for interview question
[4] See Appendix E for coding frame

participation evening for LZP and a gardeners meeting for HEP. Additionally, the gardeners of ZBT and HEP are observed twice while gardening through participatory observation. Participatory observation is valuable because "Social explanation and arguments require depth, complexity, roundedness, multidimensionality and contingency in data, for which a close up and dynamic view is required" (Mason, 2018, p. 142).

Data is gathered, collected and processed by doing content analysis (CA). Scientific literature on urban greening, environmental justice, and CUP is reflected on and structured in a literature table. Data on distribution of green throughout the city and neighborhood demographics are openly available via websites of the municipality. Additionally, five Pakhuys de Zwijger[5] webinars were joined to gain an understanding of the contextual background of sustainability, justice and green infrastructure developments in Amsterdam. Content on the initiatives was accessible via de Google Drive of De Gezonde Stad (LZP & ZBT) and sent through email by the initiator of HEP. A selection of the most relevant documents is made based on the relevance to this research. This is done by analyzing the documents through a lens of the analytical framework. The analyzed content contains the planning of the project, outcomes of surveys among residents, formal institutional and procedural arrangements, emails between stakeholders, minutes of stakeholder meetings, fund applications, websites that mention the initiative, (online) news articles, a podcast, a video, reports, interviews with external organizations and (preliminary) maps and designs. A total of seventy-five (21 LZP; 34 ZBT; 20 HEP) documents are analyzed.

Data is gathered by various search methods (SM) such as the use of Scopus, Google Scholar, and Google search. Scientific literature was searched in Scopus and Google Scholar, by search terms related to theory on environmental justice, urban greening and collaborative urban planning[6]. Relevant material was identified based on number of citations and date, where more recent literature was preferred over older literature. However, older literature of prominent authors is of course used when not deemed outdated. Additionally, relevant literature is searched by going through citations of other literature. All literature was selected based on relevance to this research. Information on the case studies and the background was searched in Google, by using the search terms "Lambertus Zijlplein", "Het Eetbare plantsoen", "Zeeburgertuin". Additionally, the websites of the municipality, De Gezonde Stad and other relevant greening organizations and platform are used for data gathering.

3.4 Ethical considerations

Ethics are considered throughout the data collection, processing and analyzing phases in questioning, observation and content analysis. In the interviews, ethical considerations are made on what was asked, how it was asked, whether and how confidentiality and anonymity in the interviewees could be guaranteed, and the power relations of the interview interaction. Before the interviews, interviewees were sent an informed consent form[7] and project information

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[5] Pakhuis de Zwijger is a platform for creation and innovation. They program about the city of Amsterdam, the Netherlands, and the world of the future (https://dezwijger.nl/)

[6] Examples are "urban greening", "green infrastructure", "nature based solutions", "climate adaptation in cities", "urban heat island", "environmental justice", "environmental justice in cities", "collaborative urban planning", "collaborative governance", "co-design", "co-development", "diagnostic framework", "diagnostic tool" etcetera

[7] See Appendix C

sheet[8], to ensure confidentiality and privacy. They were given the opportunity to ask questions about the research before signing the informed consent form. Ethical considerations have also been made in the framing of the interview questions and probing questions[9]. During the interviews, the interviewees feelings were considered, which was important, considering that some answers contained sensitive information. In observation, informed consent from all participants was gained. Additionally, I have put myself in the researcher position by observing, asking question and making notes, but was also involved in activities to gain trust among gardeners in the case of ZBT and HEP. The analyzed content partly consists of sensitive and not openly accessible data, it is therefore handled with care by anonymizing everything and asking for permission to make use of the data.

In processing and analyzing data, questions of the implications for the interested of involved parties and bodies are raised, as well as the implications of the research for these parties. The outcomes of the research are assured to not have adverse consequences any of the interested parties or bodies. This is done by anonymizing everything[10] and generalizing outcomes so that they cannot be traced to a specific participating party, body or person. It should be mentioned that ethical challenges were experienced in this research. This research is commissioned by De Gezonde Stad and inquires how their initiatives do, or do not, enhance just urban greening. Since environmental justice entails problems of inequality and marginalization, the outcomes of the research are tried to be presented carefully and sensitively, to not harm the organization or any of the other interested or involved parties or bodies, while at the same time staying critical.

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[8] See Appendix D
[9] See Appendix B
[10] See Appendix A for list of interviewees

4. CASE STUDY BACKGROUND

This chapter presents the case study background for this research. First, information is provided on the demographics, green infrastructure and relevant policies of the city of Amsterdam (2.1). Then, the demographics and green infrastructure of the neighborhoods of the cases and information on Lambertus Zijlplein (2.2), Zeeburgertuin (2.3) and Het Eetbare Plantsoen (2.4) is provided.

4.1 Amsterdam

4.1.1 Demographics

The demographics of Amsterdam are presented below in Table 4 and create an image of the city, and set a baseline to compare with the demographics of the neighborhoods where the cases are situated.

TABLE 4 DEMOGRAPHICS AMSTERDAM (ALLECIJFERS, 2021A)

DEMOGRAPHICS	DATA				
Number of people	872.922				
Male-female ratio	50% - 50%				
Average income	€31.200				
Age-groups	Largest age group is 25-45 (36%), the smallest are 15-25 (12%) and 65+ (13%)[11]				
Migration backgrounds	No migration background	44,4%			
	Western migration background	19,5%			
	Non-western migration background	36,1%	Moroccan	9,0%	
			Surinam	7,0%	
			Turkish	7,0%	
Education:[12]	Low	22,9%			
	Average	29,1%			
	High	48%			

4.1.2 Green infrastructure

The total amount of recreative green in Amsterdam is 2595,01 hectares. It has increased over ninety hectares from 2013 to 2020. The amount of m² green per citizen, however, has decreased from 31,31 m² in 2013 to 29,75m². This indicates that the green infrastructure in the city does not grow in line with the increasing population numbers (Feuth et al., 2021), which opposes the *Groenvisie 2050* (Ivens, 2020).

Comparing Figure 4 with Figure 5 shows that throughout the city, green infrastructure does significantly decrease heat stress. Green areas depicted in Figure 4 are up to twelve degrees cooler than some very concrete areas.

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[11] See Appendix F for Graph

[12] Low = finished primary school, VMBO (preparatory secondary vocational education), first three years of HAVO (higher general secondary education) or VWO (pre-university education)

Average = HAVO, VWO, MBO (lower general secondary education)

High = University of applied sciences, University

FIGURE 4 OVERVIEW GREEN INFRASTRUCTURE AND DEVELOPMENT NEIGHBORHOODS IN AMSTERDAM (MUNICIPALITY AMSTERDAM, 2020A;B)

FIGURE 5 HEAT SRTRESS IN AMSTERDAM (SOURCE: METROPOOLREGIO AMSTERDAM, 2020)

Green is not equally distributed between districts and the edges of the city are generally greener than the inner city, which is depicted in Figure 4. In proportion, the districts Centrum (2.66 m²) and West (8.34 m²) have the least square meters green space per inhabitant. The greenest part of

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the city is Amsterdam Noord (41.23% green of the total land area) with 265 m² of green space per inhabitant. Nieuw-West (29.8%) and Zuidoost (26.6%) with both 70 m² of green space per inhabitant also score high. A sidenote is that a large part of the green areas in Nieuw-West and Noord consists of urban fringe polders which are located at the very edges of the city and are not regularly used by residents of the neighborhoods. If these are excluded, only 7.7% of Noord and in20.6% of Nieuw-West 20.6% of the area is green. This amounts to 49 m² per resident for both city districts (Feuth et al., 2021). Table 5 below depicts the green areas per city district.

TABLE 5 GREEN DIVISION PER DISTRICT (OWN CALCULATION IN FEUTH ET AL., 2021) [13]

Stadsdeel	Opp groen (ha)	% groen	Opp groen (m2) per inwoner	% groen (zonder stadsrandpolder)	Opp (m2) per inwoner zonder stadsrandpolders
Centrum	22,7	2,82	2,60	2,83	2,60
West	123	11,57	8,34	11,57	8,34
Nieuw - West	1132,9	29,78	70,76	20,60	48,91
Zuid	288,7	16,72	19,73	15,37	18,14
Oost	477,92	15,62	33,64	13,16	28,36
Noord	2631,3	41,23	265,16	7,65	49,17
Zuidoost	633	28,63	70,46	27,50	67,68

4.1.3   Relevant municipality policies

The municipality of Amsterdam has launched the *Groenvisie 2050* in 2020. This is the successor of the *Agenda Groen 2015-2018*. The cities' green ambitions for 2050 are fourfold: a green and livable city for humans and animals, enough variety in green for everyone, green as contribution to several purposes and nature inclusiveness is considered in urban planning and management (Wijten, 2020). The former alderman on green has reserved €35 million to be spent on making green spaces viable and refurbishing (Ivens, L. in Pakhuis de Zwijger, 2021). The vision specifically focusses on citizens participation and stimulation of bottom-up initiatives. Little specific plans or policies to stimulate this are presented. Two important steps undertaken are however a yearly attribution of €125.000 for *buurtbudgetten* (neighborhood budgets) per district. These budgets are reserved for initiatives that increase social cohesion and wellbeing in the neighborhood. A significant number is spent on greening initiatives. Additionally, the municipality provides the opportunity for citizens to maintain green in their neighborhood themselves since 2014, which increases the feeling of ownership and quality of green (HEP-P01).

The municipality's coalition agreement 2018 – 2020 (GroenLinks, D66, PvdA & SP, 2018) states on the very first page that 'one of the main challenges is how we can make Amsterdam a just city for all.' One of the six pillars of the execution agenda of the municipality's coalition agreement 2018 – 2022 is 'pleasant neighborhoods, livable city'. An important measure in this pillar is giving

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[13] *Stadsdeel* = district; *Opp groen (ha)* = Green surface (ha); *% groen* = % green; *Opp groen (m²) per inwoner* = green surface (m²) per citizen; *% groen (zonder stadsrandpolder)* = % green without urban fringe polder; *Opp (m²) per inwoner zonder stadsrandpolder* = Green surface (m²) per citizen withour urban fringe polder

special attention to so-called development neighborhoods. This is done by for example actualizing thirty to forty projects to improve public space, greenery and playgrounds. Development neighborhoods are neighborhoods where the municipality aims to improve the livability, socio-economic position, quality of housing, living environment and built facilities and wants to link urban development areas with strategic neighborhood development and improve sustainability of housing. Figure 4 depicts where these neighborhoods are located (Municipality of Amsterdam, 2020b).

Considering both policies and the cities' current green infrastructure and development neighborhoods, it is interesting that Nieuw-West, Zuidoost and Noord (when urban fringe polders are included) have the biggest amount of green surface and are also the districts where the developing neighborhoods are situated, which are demarcated in red in Figure 4. Little green spaces are, however, located in the specific neighborhoods, especially in Nieuw-West and Zuidoost. Additionally, even though these multicultural districts with lower socio-economic status have large green areas, research shows that the amount and quality has decreased in the last years. Additionally, recently build neighborhoods show lower percentages of green (Pellerey, 2021), which is in contradiction with the greenvision 2050 which states that all newly built areas must include green. This shows the importance of achieving goals and strategies of the Greenvision 2050 and the coalition agreement 2018 – 2021 in the way forward towards just urban greening.

4.2 Case study 1: Lambertus Zijlplein

4.2.1 Demographics

Table 6 depicts the demographics of the neighborhood, Buurt 8, in which LZP is situated. It shows that the average income of the neighborhood is lower than the city's average (See Table 4). Additionally, it shows the multicultural image of the neighborhood, as almost seventy percent has a non-western migration background.

Table 6 Information & Demographics Buurt 8 (Allecijfers, 2021b)

INFORMATION AND DEMOGRAPHICS	DATA			
District[14]	Nieuw-West			
Area[15]	Geuzenveld			
Neighborhood[16]	Buurt 8			
Number of people	4245			
Male-female ratio	50% - 50%			
Average income	€19.600			
Age-groups	Largest age group is 25-45 (38%), the smallest 65+ (0,08%)[17]			
Migration backgrounds	No migration background	16,6%		
	Western migration background	14,4%		
	Non-western migration background	69,0%	Turkish	26,0%
			Moroccan	24,0%
			Surinam	6,5%
Education	Low	38,3%		
	Average	39,2%		
	High	22,5%		

4.2.2 Green infrastructure

Lambertus Zijlplein (LZP) is a grey square in a relatively green district. 41% of the land surface withing 500 meters is green. 8% of the land surface within 500 meters contains shadow rich trees (RIVM, 2019). Nieuw-West is a relatively green district (see Table 5). This is mainly attributed to the urban polders. Taking a closer look at the neighborhood (demarcated with red) provides a significantly less green view than the district does (Municipality of Amsterdam, 2020a).

FIGURE 6 GREEN INFRASTRUCTURE AMSTERDAM NIEUW-WEST (MUNICIPALITY OF AMSTERDAM, 2020A)

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[14] Refers to 'stadsdeel'

[15] Refers to 'wijk'

[16] Refers to 'buurt'

[17] See Appendix F for graph

4.2.3 The case

Lambertus Zijlplein is not functioning optimally, according to the municipality and residents (Van Weerdenburg, 2019). The shopping center does not attract enough customers, there are problems of vandalism and criminality and nuisance of loiterers and alcoholics. Once a week a market fills the square with liveliness, but the other days it is a grey square that is only visited to do groceries, while it has the potential to be the bustling center of the multicultural area Geuzenveld. Various revitalization plans have been designed in the past, but with limited success thus far (LZP-P01, LZP-P04, LZP-P05).

The municipality has therefore decided, together with the real estate owners, shopkeepers and residents, to improve safety, quality of life, quality of stay and the economy of the neighborhood. Various studies after the square were conducted in 2019 (Van Weerdenburg, 2019) and discussions were held with the parties involved. This has resulted in an implementation program Lambertus Zijlplein for 2020. A first and important part of this implementation program is *'greening in public space'*. A design has been drawn up for this, within the municipal framework and in participation with the neighborhood Greening *Lambertus Zijlplein* is initiated by the municipality in cooperation with DGS and part of a broader revitalization plan of the square. DGS oversees extensive community participation in cooperation with local organizations and residents. The latter might play a role in the maintenance of the green, once enacted. The municipality oversees further planning and enactment, in which they are advised by DGS.

The greening initiative started in 2019 and is yet to be finished by the end of this year. The green infrastructure will be planted autumn 2021 and adds to the few trees now present on the square. It will consist of a total of 15 Snowy Mespilus (*Amelanchier lamarckii)* trees and 570 square meters of greenery, divided over eight green spaces mainly located around the fish shop, as is depicted in Figure 7 below. This trees species is decided on because its potential to prevent wind nuisance, which is experienced on the square. The green spaces consist of grasses and perennials. New seating areas will be created around the greenery (Municipality of Amsterdam, n.d.;2021).

FIGURE 7 FINAL DESIGN GREEN INFRASTRUCTURE LAMBERTUS ZIJLPLEIN (MUNICIPALITY OF AMSTERDAM, 2021) [18]

4.3 Case study 2: Zeeburgertuin

4.3.1 Demographics

Table 7 below provides information on the Sportheldenbuurt, where ZBT is situated in. It is interesting that the demographics are quite representative for the city of Amsterdam (See Table 4), except for the higher number of 'other' people with non-western migration background, explained by the refugee housing and the higher number of people with high education levels. It is important to mention that this neighborhood is still under development, so the numbers are a continuous subject to change.

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[18] Dark-green dots and green rectangles depict the new green infrastructure

INFORMATION AND DEMOGRAPHICS	DATA			
District	Oost			
Area	Zeeburgereiland Nieuwe Diep			
Neighborhood	Sportheldenbuurt			
Number of people	3835			
Male-female ratio	51% - 49%			
Average income	€27.300			
Age-groups	Largest age group is 25-45 (50%), the smallest 65+ (0,04%)[19]			
Migration backgrounds	No migration background	46,0%		
	Western migration background	21,9%		
	Non-western migration background	32,1%	Other[20]	15,6%
			Surinam	11,6%
			Moroccan	4,7%
Education	Low	10,7%		
	Average	25,2%		
	High	64,2%		

4.3.2 Green infrastructure

ZBT is a community garden. As it located outside the built-up area (yet), 65% of the land surface withing 500 meters is green. 5% of the land surface within 500 meters contains shadow rich trees (RIVM, 2019). 15,6% of de surface of Oost is green infrastructure. Taking a closer look at the neighborhood (demarcated with red) shows how little green is present in the neighborhood. Trees are present around the canal, but no green of significant size.

FIGURE 8 GREEN INFRASTRUCTURE AMSTERDAM OOST (AMSTERDAM, 2020A)

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[19] See Appendix F for graph

[20] Refers to Non-western migrants and refugees from various countries such as Syria, Eritrea, Afghanistan etcetera

4.3.3   The case

Zeeburgertuin is situated on a recently developed neighborhood on Zeeburgereiland, a peninsula (also referred to as 'the island' by its residents) in the East of Amsterdam. The garden is the successor of a temporary vegetable garden in bags, hundred meters from the current garden. In 2017, a group of active residents set up a small temporary vegetable garden with containers in the Sportheldenbuurt. There was a lot of enthusiasm for this from the neighborhood and a research after the residents' needs and wants showed the need for more green space and meeting places. That is why a permanent location was sought in collaboration with the municipality and later DGS and a real estate company, which resulted in the establishment of Zeeburgertuin (De Gezonde Stad, n.d.; Tigelaar 2018).

The planning of Zeeburgertuin started in 2018 and it was enacted in December 2020. It is initiated by the group of active residents, a real estate company, DGS and the municipality. DGS's role was community involvement, consisting of four residents' meetings, a survey with 120 respondents and communication through social media. They also provided advice where necessary and to support the planning and enactment by functioning as a bridge between the residents and municipality. The initiating citizens established a garden association, which is run by a board existing of themselves. They are in the lead and organize meetings, oversee payments and decisions taken. The municipality and initiating real estate company, together with seven other real estate companies, funded the initiative, which has cost a total amount of almost 100.000 euros. The municipality was also in charge of the soil investigation.

The garden is 1000 M² and consists of a publicly accessible picking garden (1/3 of the surface) and a community garden (2/3 of the surface), aimed for the use of members of the garden association. The garden counts a total of fifty-two plots, aimed for the use of fifty citizen gardeners and two social instantons. The plots are all of different sizes, to meet different needs and wants in terms of price and maintenance and the plots are designed in the shape of a football, to meet the name of the Sportheldenbuurt (*Sport heroes' neighborhood).* A sketch of the design of the garden is depicted below in Figure 9.

FIGURE 9 ZEEBURGERTUIN DRAWING (DE GEZONDE STAD, 2019A)

4.4 Case study 3: Het Eetbare Plantsoen

4.4.1 Demographics

Table 8 depicts information and demographics on the Borgerbuurt, where HEP is situated in. Interesting aspects of the neighborhood are the relatively high number of 45-65 year old people, low average income and the high number of people with a non-western migration background.

TABLE 8 INFORMATION & DEMOGRAPHICS BORGERBUURT (ALLECIJFERS, 2021D)

INFORMATION AND DEMOGRAPHICS	DATA			
District	West			
Area	Van Lennepbuurt			
Neighborhood	Borgerbuurt			
Number of people	2900			
Male-female ratio	47% – 53%			
Average income	€23.700			
Age-groups	Largest age group is 25-45 (31%), closely followed by 45-65 (28%) and the smallest is 0-15 (1%)[21]			
Migration backgrounds	No migration background	39,5%		
	Western migration background	17,4%		
	Non-western migration background	43,1%	Moroccan	14%
			Other	13,2%
			Surinam	9%
Education	Low	37,4%		
	Average	23,8%		
	High	38,7%		

4.4.2 Green infrastructure

HEP is a community garden, located on the Nicolaas Beetsplantsoen. 29% of the land surface withing 500 meters is green. 7% of the land surface within 500 meters contains shadow rich trees (RIVM, 2019). 11,6% of de surface of West is green infrastructure. Taking a closer look at the neighborhood (demarcated with red) shows that de Borgerbuurt is a very densely built neighborhood. No significant green infrastructure is present.

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[21] See Appendix F for graph

FIGURE 10 GREEN INFRATSRUCTURE AMSTERDAM WEST (MUNICIPALIY OF MSTERDAM, 2020A)

4.4.3   The case

Het Eetbare Plantsoen is in the center of the multicultural Borgerbuurt, a relatively grey and poor neighborhood in the bustling district West. The square used to be abandoned and the hollies on the square were planted for practical rather than aesthetic reasons and used as garbage lots.

HEP is initiated by a group of active citizens in 2015, after an idea of an enthusiastic resident who wished to be able to 'grow potatoes in the neighborhood' (HEP-P05). First one and since 2017 two out of four of the previously remote vegetated areas turned into 600 m² high quality communal plots. One serves for growing vegetables (right plot in Figure 11), the other is an orchard with (fruit)trees, herbs and flowers (left plot (initial phase) in Figure 11). Since 2020 a greenkiosk is situated on the square, established in cooperation between the head gardener and various environmental organizations (Lalleman, 2021). This serves to promote neighborhood activities and information provision on sustainability and green. The garden remains under development, as the head garden has plans to opt for a third plot (bottom plot in Figure 11), which will serve as mini vineyard. An initial amount of 5000 euros was funded by *buurtbudgetten* (neighborhoodbudgets), of which 80% is spent on the kitchen garden and 20% for the new orchard (gebiedsteam OudWest, 2019). This money is provided by the municipality and attributed by the *regiegroep*, a group of citizens who have the mandate to attribute money to buurtbudget applications. "We always say that money belongs to residents, from residents and residents also judge what happens with it" (HEP-P01). Later, more funding from *buurtbudgetten* has been attributed.

The initiative is managed by a core group of gardeners led by the head gardener. An active group of twenty to forty gardeners comes together twice a week to work in the garden. The broader

community of the garden exists of two hundred people who receive a weekly e-mail. (Witmondt, 2021) Additionally, everyone who walks by or sits on the square can enjoy this piece of well-maintained green infrastructure in the center of the city.

FIGURE 11 AERIAL PHOTO HET EETBARE PLANTSOEN (WITMONDT, 2021)

5. RESULTS CASE STUDY 1: LAMBERTUS ZIJLPEIN

This chapter shows the results of case study 1: Lambertus Zijlplein. First, results on distribution (5.1) second, on procedures (5.2) and third, on recognition (5.3) are provided. The chapter ends with combining the results of three environmental dimensions (5.4).

5.1 Distribution

"The contribution to climate adaptation will be limited, of what we are doing here. It is mainly meant to do something from the residents' perspective, improve the living environment and make it cleaner." (LZP-P04)

Distribution of climate adaptive functions and positive social wellbeing effects are important reasons for the greening initiative on LZP according to the initiators. The initiative very locally reduces heat stress on the square. Additionally, it aims to increase biodiversity and decrease wind nuisance. Relaxation and social interaction are perceived as most important distributive effects in terms of wellbeing.

5.1.1 Heat reduction

The green infrastructure – trees and green spaces - are expected to decrease heat stress very locally. "In general, we of course try to tackle water overflow, heat stress and those kind of things by implementing green" said LZP-P01. Green spaces are expected to cool down the square, since the green tram stop, depicted by the light blue arrow in Figure 12, is 6 degrees cooler than LZP. The already existing trees very locally decrease the temperature by six to ten degrees, as is depicted with the dark blue arrow in Figure 12 and in Figure 13. The Snowy Mespilus trees are expected to function as such (Municipality of Amsterdam, 2021a; 2021b). However, "the greenery that can be planted is moved to the edges of the square. So that means the things you want to achieve in terms of climate adaptation, so to decrease heat stress or the wind nuisance, whether that really works as well as we would like, I honestly don't know." Said LZP-P01. Additionally, no water point is incorporated in the design to provide coolness.

FIGURE 12 HEAT STRESS IN THE NEIGHBORHOOD OF LZP (METROPOOLREGIO AMSTERDAM, 2020)

FIGURE 13 HEAT STRESS AND TREES ON LZP (METROPOOLREGIO AMSTERDAM, 2020)

Because of the limited heat reductive functions and lack of water, the square is probably not perceived as a place to escape heat during hot days. "If I don't have anything to do on the square and the weather is good, I rather go to a park or cool down somewhere" (LZP-P05). There is a need for this because of the decreasing (quality of) greenery in the neighborhood and increasing temperatures. One third of the survey respondents indicate that they want green infrastructure because it provides cooling[22] and LZP-P02 thinks "it is really important to green the square. Amsterdam-West is quite a green neighborhood, but a lot is disappearing."

The greenery will, however, increase biodiversity and reduce the wind nuisance, as specific attention to this is focused in the design (Municipality of Amsterdam, 2021a; 2021b), which was preferred by citizens[23]. It also increases awareness about green among residents. That is one of the reasons why LZP-P04 argued that even though the climate adaptive function of this specific initiative might be rather small, it is still important in the grand scheme of things. For all of this,

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[22] See Appendix G
[23] See Appendix G

maintaining quality of the green is crucial since it will otherwise lose its climate adaptive and biodiversity functions.

5.1.2 Wellbeing

Respondents of the Facebook poll (De Gezonde Stad, 2020b) indicated the importance of both relaxation and meeting people on a green LZP[24]. Both are also mentioned by all interviewees and indicated as important by Van Weerdenburg (2019).

5.1.2.1 Social meeting place

Measures are taken in the planning, design and maintenance plans to enhance social meetings. The planning process created a possibility for residents to meet each other. The design includes benches aiming to reduce wind nuisance by planting trees, which will improve the livability of the square (Municipality of Amsterdam, 2021a; 2021b). "It can only become more beautiful with green and some benches for people to sit on and meet each other" (LZP-P02). DGS and residents have opted for citizens co-maintenance, to preserve the quality and connect citizens who would otherwise not have met (LZP-P01, LZP-P02). The municipality oversees the maintenance plan and is somewhat hesitant because they are afraid of losing responsibility and a lack of ownership feeling among residents, which is needed for co-maintenance. Co-maintenance is therefore still under discussion. LZP-P01 hopes "it works out to establish a good and enthusiastic maintenance group, who will get to know each other better, so that a new community is created in the neighborhood."

On the other hand, there is a fear for an increase in litter and criminality on the square because of the greening, especially among the people who mainly visit the square at night. Therefore, according to LZP-P05, the greenery should not include too many trees because it could decrease the clarity of the square. The interviewee is afraid that otherwise 'certain' groups, indicating loiterers and alcoholics, will settle on the square in the evenings, which will create a scary ambience. LZP-P04, on the other hand, states that greenery is not the cause of these problems and green should increase the livability, not worsen it. This concern and the co-maintenance difficulty demonstrate the need for tackling underlying problems on the square.

5.1.2.2 Relaxation and stress relieve[25]

Relaxation is identified as most important reason to visit a green LZP in the survey[26] (De Gezonde Stad, 2020b) and by most of the interviewees (LZP-P01, LZP-P03, LZP-P05). Survey respondents mention that it makes them happy (80%) and that it works relaxing (62,7%).[27] Reasons for this are that "people become healthier, happier and more kind from a green and natural environment" and that "green makes you feel alive". It is often mentioned that the square should be a place where people feel at home, free and happy - a place where people would like to spend their time on (De Gezonde Stad, 2020a).

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[24] See Appendix G

[25] Relaxation and stress relieve are taken together, since they are often mentioned together by participants of the research

[26] See Appendix G

[27] See Appendix G

Stress relieve is mentioned as factor of wellbeing by a few of the interviewees (LZP-P02, LZP-P03) and during the online design presentation (De Gezonde Stad, 2020c).

TABLE 9 DISTRIBUTION LZP

MEASURE	INDICATOR	RATE	EXPLANATION
Less heat stress	Trees present to provide shade	+	Trees, but on the edges of the square
	Presence of water	- -	No water
	Cooler temperatures than surroundings	+	Very local heat reduction (not perceived as such)
More wellbeing	Good quality of the green space	-	Little green, possibility that it will be demolished
	Relaxation	++	Indicated most important
	Social meeting place	+	Will increase, but also scared of nuisance
	Stress relieve	+	Mentioned by some

5.2 Procedures

5.2.1 Principled engagement

"I did not know whether this initiative would fit the neighborhood, or whether it would be appreciated or not. But all people who live here where well represented and everyone was very enthusiastic. So, then I think, well, that is a good initiative." (LZP-P02)

The initiative is initiated by the municipality, and included DGS, residents, visitors of the square, local social organizations (De Gezonde Satd, 2020c; LZP-P01;LZP-P02; LZP-P03; LZP-P04; LZP-P05). It failed to include local entrepreneurs and market traders. The various participation possibilities and inclusion of local organizations caused a good representation of the residents in the planning processes of the initiative. The survey and online meetings enabled a broad way of participants; however, this was not always successful in including people form diverse linguistic backgrounds. This problem was overcome in the design session, because of the presence of local organization with Turkish and Moroccan speaking people. According to LZP-P03, translating the flyers to Turkish and Arabic would have helped to include more people in the decision-making process. People who are not successfully included are the local businesses people, according to LZP-P01 and LZP-P04, and recently moved house owning residents. According to LZP-P04, "Those people work somewhere else in the city and drive their cars into their garages. The don't feel connected to Nieuw-West, where they live. Their houses are there, but they don't live there." Concluding, the initiators succeeded to include two out of three target groups[28], with the linguistic barriers as most important predural reason for exclusion of certain groups.

The predominant interests of the municipality and the residents are aligned in the greening initiative through discovery and definition. The more specific interests are more difficult to align,

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[28] The target groups are: residents, square visitors and local businesses

because of insufficient deliberation and top-down determination. Main stakeholders want to increase the livability of the square and there is a consensus that green infrastructure can contribute to this (Van Weerdenburg, 2019). 61% of the respondents positively responded to more green infrastructure on the square (most popular after a more diverse range of shops with 66%). The collaboration between the municipality, DGS, residents and visitors has led to definition of common purposes of the greenery[29] and objectives regarding the design. Key conditions for effective deliberation in this initiative were overcoming language boundaries and addressing socio-economic problems underlying the fear of rubbish, vandalism, loiterers and alcoholics. The first have been tried to overcome – not always with success -, the latter have not been addressed throughout the process. "Does that mean you can never place a bench somewhere, because there is a possibility that loiterers will gather? Maybe they are bored. Look for something that prevents them from gathering there, but instead find something to enjoy themselves" (LZP-P04).

5.2.2   Shared motivation

The initiative copes with a lot of distrust and little mutual understanding between the residents and municipality, due to past events. "It is nice when things change, and the neighborhood is involved. I think that is important. Too often things are changed that do not fit the neighborhood. You gain nothing with it in that case. You build something that costs a lot and people do not see the purpose or do not even like it at all" (LZP-P05), also acknowledged by LZP-P04. The CUP initiative has tried to tackle this by including DGS, who in their turn included local organizations who are trusted and understood by residents. However, the lack of trust in the municipality decreases peoples' commitment in the participation process and potentially in the maintenance as well. It also makes legitimacy of decisions, which are in the end taken by the municipality, less self-evident. Well execution of the green infrastructure which takes preferences of residents into account is therefore considerably important, because it creates more trust and mutual understanding for future initiatives on the square, which are crucial to increase its livability. This is, however, in danger because the importance of the greening initiative is undermined within the municipality, because of the small amount of green. To avoid this, LZP-P04 suggests that it should be looked at from a holistic climate adaptation view so that green is put higher on the agenda; it might cost money in the short term, but on the longer term it is very important to keep the city livable (LZP-P04). A higher level of residents' participation could help to overcome this, as the importance of the initiative does not only lay in the number of trees, but in making residents feel heard and proud of the square, so that a feeling of ownership is created, and the livability of the square is improved. "Providing insight into the importance of green is important for enthusiasm" (Civil servant in Municipality of Amsterdam, 2021b).

The difficult processes underlying the (lack of) mutual understanding, reveal that only when misunderstandings and distrust are overcome, residents will feel committed to participate in maintaining the quality of green infrastructure and the initiative will gain legitimacy. Well execution, clear communication and participation are therefore very important. LZP-P04 said "That is why I really hope this initiative will come about. Because if they do not enact this... This is the baker mat for the rest of the participation on the square and trust in the government.

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[29] High quality, biodiversity, decreasing wind nuisance and heat, increasing social cohesion, and creating a pace for relaxation

5.2.3 Capacity for joint action

Relevant knowledge of different stakeholders is used, but fragmented top-down leadership, arrangements and attribution of monetary resources restricted equal access to leadership roles, knowledge and resources, which in turn hindered capacity for joint action, because it makes the planning and enactment of the initiative to take longer and makes all stakeholders very dependent on the capacity of the municipality.

The knowledge of DGS on how to involve the neighborhood is effectively made use of. DGS, in their turn used the knowledge and resources of local organizations on existing social ties and their well-known position in the neighborhood, which was a key factor to successful involvement of residents and the ability to use their knowledge. "I know a lot of youngsters, who visited the design session because they saw me. One eight-year-old boy had very interesting things to say" (LZP-P05). The initiative is funded by the municipality's green funding. Fragmentation and top-down allocation of money were issues in this. The first hindered the initiators from taking a holistic climate adaptive approach. "Money had to come from all different jugs" because "green is always a side issues in projects like these. They (*the municipality*) must start looking at it from a higher level of climate adaptation. In that case, your always financially backed when someone the says 'green costs money' because it is acknowledged that it needs to be done, because green is very important." (LZP-P04). Top-down allocation of municipality money slowed the project down, as well as continuously changing leadership roles and responsibilities, because the ambitious district president (*stadsdeelvoorzitter*) of Nieuw-West wanted to take his hand on LZP but did not have the financial resources for it.

The municipality is in charge the predominant and final decisions, advised by residents and DGS. "It is not in our hands whether it is constructed or not" (LZP-P01), but rather in the hands of the municipality's green managers - "You see that those green managers leave an enormous mark on whether something will happen or not, because they do or do not want to maintain it" (LZP-P04). This makes all other stakeholders very dependent on the municipality, while a more equal access to leadership roles, knowledge and resources could overcome this problem by for example co-maintenance.

TABLE 10 PROCEDURES LZP

MEASURE	INDICATOR	RATE	EXPLANATION
Principled engagement	In- exclusion of all relevant voices	+	Except for businesses and schools, all affected stakeholders included
	(In- exclusion in) Iteration of discovery, definition, deliberation, determination	+	Yes, but underlying difficulties can be scrutinized more
Shared motivation	Mutual understanding and trust → legitimacy	-	Little trust and understanding in municipality (and other way around) complicates process
	All relevant stakeholders feel commitment to the initiative	-	Dependent on few within municipality, to be determined for citizens
	Existence of procedural and institutional arrangements	+	Existent within municipality
Capacity for joint action	Participants have equal access to knowledge, resources and leadership	-	Predominantly in the hands of municipality

5.3 Recognition[30]

5.3.1 Cultural needs, wants and concerns

The initiators have tried to involve people of different cultures, and recognize the importance of addressing people needs, wants and concerns, but do not act on this. Whether cultural domination, nonrecognition and disrespect play a role in this neighborhood is not incorporated and inequalities are not specifically tried to be tackled. Dangers of cultural misunderstandings exist.

The cultural aspects of the neighborhood are not specifically considered regarding the greening initiative, acknowledged LZP-P04. The failures and misfit of previous renewal projects on the square and in the rest of the neighborhood, mentioned by LZP-P05 and survey respondents, show the lack of (cultural) recognition. LZP-P04 said that "you would say that it makes sense: when it's warm, you want to sit in the sun. But specifically, those people (*people with non-western migration background*) want to sit in the shade. As a designer, you need to take those things into account. The municipality is working on it, but there is a lot to improve. You need someone in your team who really knows what the neighborhood consists of."

One concern mentioned regarding to cultural recognition is that immigrants and people with non-western backgrounds generally do not have a positive image of the government, according to LZP-P04. Previous misfits of redevelopment projects and the expressed dissatisfaction about this (LZP-P04, outcomes Facebook poll) shows that this is an important problem to tackle. Therefore, the involvement of local organizations was important, to overcome this perception and to make

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[30] Assessing the tackling of processes underlying exclusion and whether everyone feels welcome happens within the sections on cultural and socio-economic needs, wants and concerns for all results chapters

residents feel like they were designing and creating the living environment according to the needs and wants of themselves and their community.

5.3.2 Socio-economic needs, wants and concerns

Three risks of undermining socio-economic needs, wants and concerns come about in the co-maintenance dilemma, the participation process and the question of for whom the square is being greened and improved. The market, on which many visitors depend for cheap groceries, is recognized as important socio-economic entity and this greening initiative follows from the bad socio-economic status of the square (civil servant in Municipality of Amsterdam 2021b), which shows signs of considering socio-economic needs and wants of the underprivileged in the neighborhood.

The low socio-economic status of the neighborhood complicates co-maintenance of greening initiative once it is enacted (De Gezonde Stad, 2021). On the one hand, the residents, visitors and local business owners do not feel lik ehtey have time to maintain the green, because they have a family to take care of or a – not very well functioning - business to run. This is substantiated by the notion that Geuzenveld, where LZP is situated, is the area where relatively few requests have been made for *buurtbudgets* compared to the rest of Amsterdam in 2020 (Municipality of Amsterdam, 2021b). Users of the square want a livable square, but do not have the resources to act upon this. LZP-P01 acknowledged that "you notice in the participation process that the entrepreneurs are having a hard time. They are busy running their business and keeping their shop open at all on such a square, which actually doesn't go very well." They are therefore dependent on the local government to create a livable square. The government can make less money available for the green infrastructure when it will be maintained by officials. Additionally, the maintenance officials have little trust in the residents to keep the green clean and intact, and therefore advocate for an easily maintained design. Therefore, the low socio-economic status of the neighborhood hinders the quality and magnitude of the greenery.

The same difficulty is present in the participation process. As LZP-P01 acknowledged, attending a participation evening or afternoon is a lot to ask for some people, especially the more vulnerable ones. LZP-P03 argues that especially for the people with children it is difficult to attend a participation session at the organized time. However, it is crucial that the green infrastructure should be informed by residents, because of their distrust in the municipality's promises due to past renewal that did not fit the neighborhood or was never enacted and the history of socio-economic difficulties such as poverty, criminality, loiterers and vandalism on the square. This is a difficult contradiction of interests to tackle.

Additionally, green infrastructure is the first step of a grand renewal plan for the square and is aimed to get the conversation about socio-economic improvements started. According to LZP-P04, green is relatively easily accessible topic that people do want to talk about. "Green is a beautiful realization of the whole story, but I am even happier with all the collaborations than with the flowers" (civil servant in Municipality of Amsterdam, 2021b). Green makes the neighborhood more attractive. This is not unlikely to increase housing prices, especially because the initiators aim to attract more dual earners by greening the square with more money to spend on the market and in the shopping mall. (De Gezonde Stad, 2020d). This argument is substantiated by the rapidly increasing housing prices (29,3% in the last six months

(Huizenzoeker, 2021) and increasing houses for sale. A remarkable comment in the survey: "*Geusje* is *Geusje* and there we have the yuppies with their flowers and plants. The neighborhood is the neighborhood and hopefully stays the neighborhood" (De Gezonde Stad, 2020b). Increasing livability is good, but close attention should be paid to not push people away, which is not observed. Therefore, problems of exclusion may arise.

However, the green infrastructure is built around the market because it is recognized as important socio-economic entity. Green infrastructure is important to make the city climate adaptive and the square livable, both in environmental and socio-economic views, so it cannot be implemented at the expense of the market traders and people who rely on the market for their cheap daily groceries. It is therefore a just decision to build the green around the market instead of weeping it away.

Concluding, socio-economic needs and wants of residents, visitors and shop/market owners in the participation process and maintenance are not actively considered, which creates a danger of exclusion and not feeling welcome anymore in the longer term, also called (green) gentrification. It is therefore important that these are closely looked at, which is for example done my recognizing the market as important socio-economic entity and not let the green infrastructure be at the expense of the market. However, because the initiative is organized rather top-down, the danger of misrecognition exists.

TABLE 11 RECOGNITION LZP

MEASURE	INDICATOR	RATE	EXPLANATION
Recognition of different cultural and socio-economic needs, wants and concerns	Cultural needs, wants and concerns are acknowledged and anticipated on	-	Only in the distrust towards municipality
	Socio-economic needs, wants and concerns are acknowledged and anticipated on	-	Acknowledged but barely anticipated on
	Processes underlying exclusion are tried to be tackled	- -	Not discussed in the project
	Everyone feels welcome in the green space	+	Exclusion is currently not observed

5.4 Relation between distribution, procedures and recognition

The initiative started from recognizing the square as a place that needs attention because of the socio-economic problems that currently exist. This should be considered in further development of the initiative and beyond, for the initiative to enhance just urban greening outcomes, because rising inequalities in the neighborhood loom. Representation of relevant stakeholders plays an important role because it increases the probability that the green infrastructure fits the needs and wants of the residents, visitors of the square. This is important because of the current mistrust in the municipality's renewal plans. The high level of participation and collaboration between various stakeholders in the planning phase has led to enhancement of just processes. However, just outcomes in terms of positive distributional effects of the initiative, will only come about when all relevant stakeholders are equally involved throughout the entire planning,

enactment and maintenance processes and the low socio-economic status of the neighborhood is incorporated. If not, the greenery is likely to not remain its quality, because of the little ownership people feel, as has been experienced in the past. The collaborative nature of the initiative has a better potential to overcome the co-maintenance issue than when this project would have been executed by the municipality only, because DGS has advised the municipality to incorporate a co-maintenance plan. This, however, only holds if the citizens feel ownership and have the socio-economic capacity to maintain the green infrastructure. Trust, commitment and mutual understanding are currently lacking preconditions for this. This is less likely to happen because the initiative is municipality-led and initiated.

Because little specific attention is paid to climate change adaptation, the distributional effects in terms of heat reduction will be rather limited. Not only does this hinder the distributional effects, but also the procedures because less money is attributed and little attention is paid to important issues such as co-maintenance. Although collaborative in nature, the municipality plays a leading role in this initiative. It is expected that more collaboration, could have enhanced just urban greening better, in terms of outcomes of the initiative. This argument is substantiated by the success and satisfaction that is expressed in all participation events which included local organizations.

Concluding, the inclusive and well thought of participation process in CUP does not necessarily lead to important distributional effects of the green infrastructure. The green infrastructure that will be planted on square is rather limited. This is mainly due to the many restrictions on the square, being the market, the cables and lightning. The socio-economic aspects also play a role in this because of the limited trust both ways top down (how are citizens going to keep it clean?) as bottom up (limited trust in the municipality after all the empty promises). Giving more stakeholders access to knowledge, resources and leadership could have led to a more ambitious design, with more climate adaptive functions and less disappointment, which is important considering the history of distrust and unsatisfactory square refurbishment.

This chapter shows the results of case study 2: Zeeburgertuin. First, results on distribution (6.1) second, on procedures (6.2) and third, on recognition (6.3) are provided. The chapter ends with combining the results of three environmental dimensions (6.4).

"A unique collaborative project of residents, private and public parties that contributes to a green, healthy living environment and social cohesion in a new neighborhood under development"
(DGS, 2018).

6.1 Distribution

"A nice initiative that gives people pleasure, embellishes the neighborhood and maybe does something good to the planet" (ZBT-P06).

6.1.1 Heat reduction

Even though initiators of ZBT indicate to prioritize climate change adaptation, and heat reduction specifically as well (A.S.R. Real Estate, 2020; De Gezonde Stad, 2018), citizens do not take notice on this; the garden is not used as place to escape heat during hot days. Some small trees are present to provide shade, but no water is present. The garden is up to 3 degrees Celsius cooler than its surroundings (See Figure 14 below).

FIGURE 14 HEAT STRESS IN THE NEIGHBORHOOD OF ZBT (METROPOOLREGIO AMSTERDAM, 2020)

The initiators of ZBT focused on an integral approach by aiming to make the green infrastructure climate adaptive, consider biodiversity and contribute to social cohesion (A.S.R. Real Estate, 2020; De Gezonde Stad, 2018; ZBT-P01; ZBT-P04). "For heat stress it also makes a difference if you add more green infrastructure of course" said ZBT-P05. Additionally, ZBT-P01 indicates that "the green is a place with fruit trees and green where you can nicely stay, sort of, sheltered from the sun" (ZBT-P01). Adapting to climate change is, however, not prioritized among all stakeholders. "It is a nice incidental touch for me" said ZBT-P07. Overall, the participants think that "the direct impact on the climate seems to be less." (ZBT-P03) "To what extent can these kinds of things contribute to a better climate? Well, then you get your heads up too high, it is a bit too small for that" (ZBT-P02). Additionally, the limited shade options. "For the shade it is not going to add much, the same counts for the trees" (ZBT-P02) and well insulated newly build houses cause that the garden is not a space to visit on hot days. Despite the expressed doubts on the heat reduction function of ZBT on its own, its function in "The grand scheme of things" (ZBT-P06) and "the bigger picture" (ZBT-P04) are acknowledged, because it increases awareness on green.

Besides heat reduction, other climate adaptive and resiliency factors are often mentioned: water intake, biodiversity, shorten food chains and CO_2 absorption. Water intake is deemed important (ZBT-P01, ZBT-P04, ZBT-P05, ZBT-P06) and calculations on rainwater fall, including peak rain, have been made to estimate the water absorption of the garden. ZBT alco contributes to biodiversity (ZBT-P01, ZBT-P04). The garden makes use of biological seeds and fertilizers and natural fermentation. "The type of green they grow is of a higher quality than before, so I assume it is an improvement in terms of biodiversity" said ZBT-P02. Food provision is also mentioned (ZBT-P06) However, food provision is not the main priority (ZBT-P06, ZBT-P07), but rather a good side effect for most participants. It does however increase awareness about how food grows (ZBT-P07) and it change their food consumption (ZBT-P06). "And of course, a bit of greening is also the CO_2 emissions.", said ZBT-P04. This is not substantiated further.

6.1.2 Wellbeing

The distributional effects of wellbeing are widespread, albeit for the participants (ZBT-P02, ZBT-P03, ZBT-P06, ZBT-P07). The garden is very important in its role as social meeting place, but also as space to relax, which relieves stress, are identified as important for gardeners.

6.1.2.1 Social meeting place

"It is amazing for your social contacts. Because you encounter and get to know people here, I also encounter them at the vegetables shop and in the supermakret. I would have encountered them anyways, but I would not have known them" (ZBT-P02).

The function of a social meeting place is perhaps the most important positive distributional effect of the garden. The participatory development process, design and the fact that the neighborhood is recently built contribute to this. The location outside the build-up area and little variety in people, on the other hand, hinders the social meeting place function. Residents could meet each other in by DGS organized meetings. People who did not want or received a plot, did have the opportunity to meet each other. It is unknown whether these contacts lasted. Including a freely accessible picking garden in the design aimed to connect segregated groups in the neighborhood and connect people from different socio-economic and cultural groups (ZBT-P06, ZBT-P07, ZBT-P05, ZBT-P01). "That is one of the positive effects this garden has had, I think. A community has appeared among the members of the garden association. That is great. And because there is also a picking garden, the people who are not a member have also gained a social meeting place in the neighborhood" (ZBT-P05). The latter does not hold (yet). That can be attributed to the novelty of the initiative, as well as to the little diversity and the location. The one-sidedness of the gardeners does namely withhold some, younger, participants from participating (ZBT-P06), while the older gardeners do participate to meet other, younger, people, to escape from their own bubble (ZBT-P02). Lastly, because the neighborhood has only been built recently, people are eager to make something out of the neighborhood where they have just moved in (ZBT-P02). This enthusiasm contributes to the community feeling and the initiative's function as social meeting place.

6.1.2.2 Relaxation and stress relieve

"I just love the gardening. I still have to learn a lot, but that does not matter. It is fantastic." (ZBT-P02)

Relaxation in terms of educating the self about gardening, (the importance of biological) food, the seasons and green is one of the main reasons for a lot of participants to be part of this initiative (observation, February 1, 2021). A lot of the participants do not own a private garden and feel more connected and aware to nature because of participating in the garden, which makes them appreciate and value nature more, which in turn increases their wellbeing. (ZBT-P02, ZBT-P03, ZBT-P06). This also increases their perception of the importance of environmental sustainability (ZBT-P01, ZBT-P04).

The importance of the function of relaxation and stress relieve is reflected in the future inclusion of more vulnerable people in the neighborhood, which follows from doctors' and social workers advice to ZBT-P07. "I do think that the main reason has not to do with sustainability or greening, but with having something to do and not feeling lonely." Most people working in the garden are

elderly, so they do not have much commotion in their lives. The garden helps them to have something to do(ZBT-P07).

TABLE 12 DISTRIBUTION ZBT

MEASURE	INDICATOR	RATE	EXPLANATION
Less heat stress	Trees present to provide shade	+	A few (small) trees in the picking garden
	Presence of water	- -	No waterpoint
	Cooler temperatures than surroundings	+	Very local heat reduction (not perceived as such)
More wellbeing	Good quality of the green space	++	High end garden is quality increase compared to remote grassland before
	Relaxation	+	Garden is used for his purpose, but no equal inclusion citizens
	Social meeting place	+	Main purpose of the garden, but no equal inclusion citizens
	Stress relieve	-	Not mentioned specifically, but indicated in relaxation

6.2 Procedures

6.2.1 Principled engagement

Throughout the planning and enactment processes, residents, real estate companies, DGS and the municipality were included. Concerning residents, elderly people are overrepresented in comparison with the neighborhood demographics. Additionally, "certain parts of the island are really underrepresented. People from social housing and status holders are not to be found here, actually" (ZBT-P02). The same counts for young people. For social cohesion it is important that the demographics of the neighborhood are reflected in the garden, according to ZBT-P07. Additionally, the initiative did not manage to include schools, the institution for physically disabled people and did not think of including local businesses and entrepreneurs. ZBT-P06 said "there is also a local Turkish vegetables shop. It would have been nice if he would have received a piece of land, where he could have grown Turkish crops, for example." They did, however, recently include the community center, via the ties of the older active gardeners, through which the gardening association tries to engage a more diverse audience. ZBT-P07 said he proposed to the gardening board to include refugees. Their reply was: "Please do, we are way too white." This leads to the conclusion that the initiative includes multiple initiating stakeholdes, who have not succeeded in including a wide variety of residents (yet).

In discovering and defining shared interests, purposes and objectives, the interests of the residents who lived in the neighborhood at the time, the municipality, DGS and the initiating real estate company and municipality were aligned[31] and resulted in the development of ZBT. Overall,

[31] Residents: create a scoail meeting place and location to grow own food (ZBT-P02)
Municipality: implement green infrastructure with a social function (ZBT-P02; ZBT-P05)
DGS: recruit new greening initiatives where they could play a role in community building and implementation (ZBT-P02)

few opposing interests and conflicts were encountered throughout the planning and enactment (ZBT-P01, ZBT-P02, ZBT-P05) despite the many different stakeholders (ZBT-P05). ZBT-P04 does mention the possibility to include real estate companies earlier in design processes, to increase efficiency. "The needs and wants of the neighborhood and what kind of place ZBT should be, are gathered in a broad sense" according to ZBT-P05, through the participation process of DGS. This, however, only included people who lived in the neighborhood at the time, which were mainly people with self-build lots and tenants of the investing real estate companies. Because of the enactment of a garden association, the board of the association have mainly been involved in these processes regarding design and other agreements, as representatives for the gardeners (ZBT-P06).

6.2.2   Shared motivation

Because of the existence of the initiating residents their motivation and commitment, the other initiating stakeholders were motivated in contributing to the enactment of the garden and trusted the initiating residents in being capable of managing the garden. A co-management contract is signed to assure this motivation (De Gezonde Stad, 2019b). Now, because of the commitment - in terms of time and effort the initiating residents (now the garden association board) have put in the garden - they have also gained trust from the gardeners. This, in term, motivates gardeners to commit themselves (ZBT-P01, ZBT-P04, ZBT-P05). Being a gardener asks for a certain commitment. Besides paying for the plot, all respondents who work in the garden commit to maintain a plot (ZBT-P02, ZBT-P03, ZBT-P06). ZBT-P07 identifies this as a threshold for some people to participate. There is a need to have enough time and space for this. For those people, operating in a group instead of as an individual can help, so that less commitment is asked. The presence of shared motivation is thus an important success factor of the garden but also emphasizes the need for having enough resources to be able to commit.

6.2.3   Capacity for joint action

Some intra- and inter-procedural and institutional arrangements enhanced equal procedures whereas others have led to exclusion of voices. A reason for exclusion is that the plots cost money. According to the municipality and DGS there should be a regulation for free plot for people with a "minimapass"[32]. Up until now, no such regulation applies to the ZBT, but will maybe apply later, according to ZBT-P02. However, the plots' prices vary between forty and hundred euros a month, to make it "to make it affordable for people with little to spend as well" (ZBT-P01). Additionally, everyone can freely access the picking garden and two plots are reserved for social organizations. Another reason for exclusion is that the garden works on a "first come, first serve basis" (ZBT-P02). Because the garden is initiated by residents who already lived in the neighborhood, and they recruited within their own community, residents who moved to the neighborhood later have a smaller change to receive a plot. An interorganizational arrangement is the co-management contract of the residents, which makes sure the residents maintain the garden. A formal regulation of the Woningwet (HousingLaw) has demotivated social housing corporations to invest. It prohibits housing associations from receiving subsidies for green areas that are not directly attached to the real estate (ZBT-P04; Woningwet 1991). However, housing corporations

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Real estate company: increase the living pleasure of their tenants, so that they pay the rent and "a happy tenant is a paying tenant", "doing something back to the neighborhood" and value increase for their real estate(ZBT-P04
[32] Citizens of Amsterdam with low income and little capital can apply for this pass.

do not have a budget as large as corporate real estate companies. Real estate companies that have invested actively reached out to their tenants about the Zeeburgertuin, which the social housing corporations did not, because they did not invest(ZBT-P04). This might have led to less people from social housing.

The wide variety of stakeholders involved in this initiative, increased shared knowledge, which has enhanced and accelerated planning and enactment processes. It caused interdependency, but also possibilities to provide a safety net when one party falls out (De Gezonde Stad, 2018). DGS has good relations with the municipality, is an expert in setting up greening initiatives, took over the lead from the municipality and had more time and priority in doing this. "The inclusion of DGS created new possibilities" said ZBT-P05. ZBT-P02 indicated that "they became the client instead of us (*the gardening board*), to develop the garden and acquire money etcetera. This was ideal, since we would have never made it in that manner." The residents' networks in the neighborhood were useful in involving citizens, albeit mainly within their own communities. Additionally, including more stakeholders has increased financial resources. The municipality and real-estate companies co-financed the initiative. Including the latter has positively affected the outcome of the greening initiative in terms of size and quality of the garden (observation online investors meeting, February 1, 2020).

TABLE 13 PROCEDURES ZBT

MEASURE	INDICATOR	RATE	EXPLANATION
Principled engagement	In- exclusion of all relevant voices	+	Many stakeholders, but some resident groups, social organizations and social organizations excluded
	(In- exclusion in) Iteration of discovery, definition, deliberation, determination	+	Thorough iteration among those who are involved
Shared motivation	Mutual understanding and trust → legitimacy	++	High motivation and legitimacy
	All relevant stakeholders feel commitment to the initiative	+	Stakeholders feel/felt committed because of urgence
Capacity for joint action	Existence of equal procedural and institutional arrangements	-	Certain attention to it, but not always equal outcomes
	Participants have equal access to knowledge, resources and leadership	+	Good use of all three but no equal access

6.3 Recognition

6.3.1 Cultural needs, wants and concerns

"I have to say I always find it difficult that you continue to move in your own segregated circles on the island. A garden like this has the potential unravel that kind of social and intercultural stuff a bit. We could do better in that sense" (ZBT-P04).

Overall, it can be concluded that different cultural needs, wants and concerns are not considered in this initiative. It is not prioritized among the initiators, which is reflected in the lack of variety in different cultures in the garden. This can be explained by the segregation on the island. The people in the garden have little contact with for example the refugees and people of non-western migration background, who often live-in social housing. Women with non-western migration backgrounds have indicated to be interested in working on the garden but they have not found their way to the garden (yet).

A reason for the latter is that both civil-servants and the board of the garden association are hesitant in actively involving and therefore fostering different cultural groups (ZBT-P02; ZBT-P07). "Involvement of refugees will be through social organizations and preferably in a way that is not stigmatizing. Because we do not let refugees pass other people on the waiting list. You can't do that" (ZBT-P02). Some interviewees recognize that involvement of more vulnerable groups or 'unusual suspects' takes effort and does not work the same or as easy as the group that is currently represented in the garden. It is also acknowledged that the gardeners are involved because they are part of communities that already exist. "It is a very mixed neighborhood. But well, the community garden is a perfect example of that: natural intercultural and socio-economic mixing does not work that easy" ZBT-P07. However, inequalities in terms of in- and exclusion already exits and need to be tackled. ZBT-P07 does not believe that mixing groups of people happens on its own. According to him, people from the municipality think a bit too lightly about that, because he sees a shift in policymaking that moves towards 'everyone has to do it on their own.' In this way you keep the exclusion in his opinion.

This trend seems to be in contradiction to the municipality's aim to design the neighborhood in a way foster integration between different cultural groups (Municipality of Amsterdam, 2018). However, until now, not much integration between cultural groups takes place. In its enactment, ZBT was supposed to be a location where cross-cultural meetings should take place. It is a garden for all residents, aiming to increase social cohesion and strengthen ties. "That was the idea in my opinion (to involve refugees). Mainly women in the neighborhood. To let women from the refugee group work here and to make them integrate better in Amsterdam and this neighborhood." Said ZBT-P05. *Refugee women have indicated to want this, because it is in their culture to grow crops themselves.*

6.3.2 Socio-economic needs, wants and concerns

"I proposed to be able to meet as many different needs as possible in that garden, by creating different types of gardens" (ZBT-P01).

Different economic needs and wants are recognized but not prioritized in this initiative. The various options suggested provided by the municipality and DGS to foster participation of people with a lower socio-economic (eg. let people pay according to their income) status did not make

their way to the policy of the garden association. However, the plots are tried to be held as cheap as possible, to make it as inclusive as possible, according to ZBT-P01. Additionally, the initiating organization and municipality both mention the implementation of free plots for people with a 'stadspas' or 'minimapas'. However, this has not (yet) been implemented. A financially healthy garden association is more important than regulations for free plots for the economically vulnerable people. In the longer term, when the garden is up and running, they might think about this (ZBT-P02; ZBT-P06).

It is recognized that gardening is not a first necessity of life, but rather a hobbyist activity. At least in the way that ZBT is used and perceived by the participants. Predominantly highly educated, older, white people are to be found in the garden (ZBT-P05, ZBT-P02). ZBT-P02 and ZBT-P07 acknowledged that "when you are busy with keeping your head above the water", you may not feel the time and space to garden. "It is a real challenge to make sure you have some people who are stable enough. That you know they will come every week and not someone who, for example, gets depressed again and you then do not hear from for two months. Because that is just how it goes sometimes" (ZBT-P07). This argument is strengthened by the fact that older people are overrepresented in the garden, because a lot of time (ZBT-P02, ZBT-P03). The initiators should recognize these patterns they want to act upon the needs and wants of all residents of the neighborhood.

Various reasons for the nonrecognition of socio-economic needs and wants of marginalized people are found. First, LZP-P01 said it was difficult for DGS to incorporate the demographics of the neighborhood in this initiative, because it is a neighborhood in development. However, the demographics could have been derived from the planning for housing types. Second, the board of the garden association play an important regulatory role and do not activelyrecognize different needs, wants and concerns, but try to include different cultural groups by allocating one plot to the local community center. This hints rather to notions of equal procedures and distribution than recognition. Third, the interests of private equity investors is to increase the beauty of the neighborhood, to make tenants are happy about their living environment and, and increase the value of their property, according to ZBT-P04 and observed in an online investors meeting (Februray 1, 2021). They do not prioritize including needs and wants of marginalized people. They are not the tenants of the investors, because the social housing corporations and organization for physically disabled people are not included in the project (ZBT-P04).

Concluding, little specific attention is paid to socio-economic and cultural needs, wants and concerns. There is no case of exploitation, economic marginalization or deprivation. However, because of the positive distributional effects of ZBT, recognizing the needs, wants and concerns of those who are isolated or have less automatic access to social initiatives, it is important to include all citizens and relevant stakeholders who might benefit from this. This has not happened, but no intentional justice deficiencies occur here.

TABLE 14 RECOGNITION ZBT

MEASURE	INDICATOR	RATE	EXPLANATION
Recognition of different cultural and socio-economic needs, wants and concerns	Cultural needs, wants and concerns are acknowledged and anticipated on	- -	Not anticipated on until now
	Socio-economic needs, wants and concerns are acknowledged and anticipated on	-	Not anticipated on until now, but involvement community center might change this
	Processes underlying exclusion are tried to be tackled	- -	Not mentioned or tackled
	Everyone feels welcome in the green space	-	Gardeners do, other residents have not yet discovered garden

6.4 Relation between Distribution, Procedures and Recognition

The many different stakeholders and high level of collaboration has been key to the success of the garden. It has led to more financial resources, a broader community and stakeholder involvement, provision of a social meeting place, a bigger garden with a design which fits the neighborhood and high-quality greenery. It has caused the initiative to be more biodiverse and better take in water. Additionally, it has created more awareness on the importance of green infrastructure and local food production. The bigger size and better quality has not directly contributed to heat reduction. The initiators aspired a heat reductive garden, but have not taken specific measures to implement this, only some small trees are present. Aiming for climate adaptation through heat reduction is thus not enough when it is not put to action in terms of type of plants or water provision. The present distributional wellbeing effects are merely beneficial to the predominantly old and white gardeners of the community plots, while the entire neighborhood is meant to be included in the initiative's planning and enactment, through community engagement and the freely accessible picking garden. These causes a need for attention to the procedures of the initiative and recognition of different socio-economic and cultural needs, wants and concerns.

Misrepresentation of the more vulnerable groups on the island causes a need for attention in actively engaging them. Priority measures for the more vulnerable groups, mentioned by the municipality and DGS, leans more towards redistribution than recognition. Since the board does not prioritize to fulfill social functions and consists of predominantly older, white people who live in expensive self-build plots, the same type of people has been included in the decision-making processes. Even though a wider variety of people is now tried to be included, most decisions have already been made. The broader community can therefore participate in the future, but to a lesser extent influence the initiative. There is a need for recognizing the existing inequalities in the neighborhood, such as segregation on the island and the fact that some people do not have time and money to work in a garden, which have led to the maldistribution of benefits the garden provides and misrepresentation of the younger people (including the schools), the refugees, the social housing and the housing for people with disabilities. The misrepresentation of these groups is recognized by the initiators and now tried to be acted upon, by the involvement of the community center. This demonstrates how collaboration can enhance inclusion of minorities and

recognition of different socio-economic and cultural needs and wants, through using knowledge and resources of different stakeholders, when actively paid attention to and in the presence of equal procedures.

7. RESULTS CASE STUDY 3: HET EETBARE PLANTSOEN

This chapter shows the results of case study 3: Het Eetbare Plantsoen. First, results on distribution (7.1) second, on procedures (7.2) and third, on recognition (7.3) are provided. The chapter ends with combining the results of three environmental dimensions (7.4).

LEFT: COMMUNITY GARDEN, RIGHT: PICKING GARDEN (BUURTGROEN020, 2018)

7.1 Distribution

"The initiative group of Het Eetbare Plantsoen consists of motivated and passionate experienced amateur vegetable growers, who are committed to their neighborhood when it comes to quality of life, social cohesion and the environment" (Gebiedsteam Oud-West, 2019).

7.1.1 Heat reduction

The initiative does not directly reduce heat stress on the square. Awareness and indirect effects (by inspiring others to start a greening initiative) are, however, important to make the city heat resistant. Additionally, other climate adaptive and mitigating functions are present.

"We can grow watermelons here because it is so hot here in the city; is that an advantage or not? I know it's a disadvantage, the petrification. We would prefer a whole part of the square to become green, because we think there is much too stone here, it is way too hot" (HEP-P05).

"We cannot say that in five years we have created a less hot square. I never measured temperature differences between the desert it was and the green it is now. I am afraid there is no significant difference. But we do our best - that is all we can do" (HEP-P05). LZP-P02 also "wouldn't say that it tackles urban heat island. Not at least to be relevant." A total of thirty trees, mainly fruit trees, are planted in the gardens. "I wish that much higher trees could be planted, because then I would quite like to create a mini forest" (HEP-P05). However, the trees cannot be more than 1.80 meters high, because the square is designated as *plantsoen*, which is a square with perennials that must adhere to the rules prescribed by the municipality concerning these types of squares (LZP-P05). Therefore, little shade is provided by the trees. No water point is available to provide coolness. Figure 15 below confirms the interviewees' expectations of the limited heat reductive function of the initiative. The square is depicted with the blue arrow. The gardens are

depicted with the blue outline. The already existing trees provide more coolness than the gardens of HEP. It is therefore concluded that the greening initiative does not reduce heat.
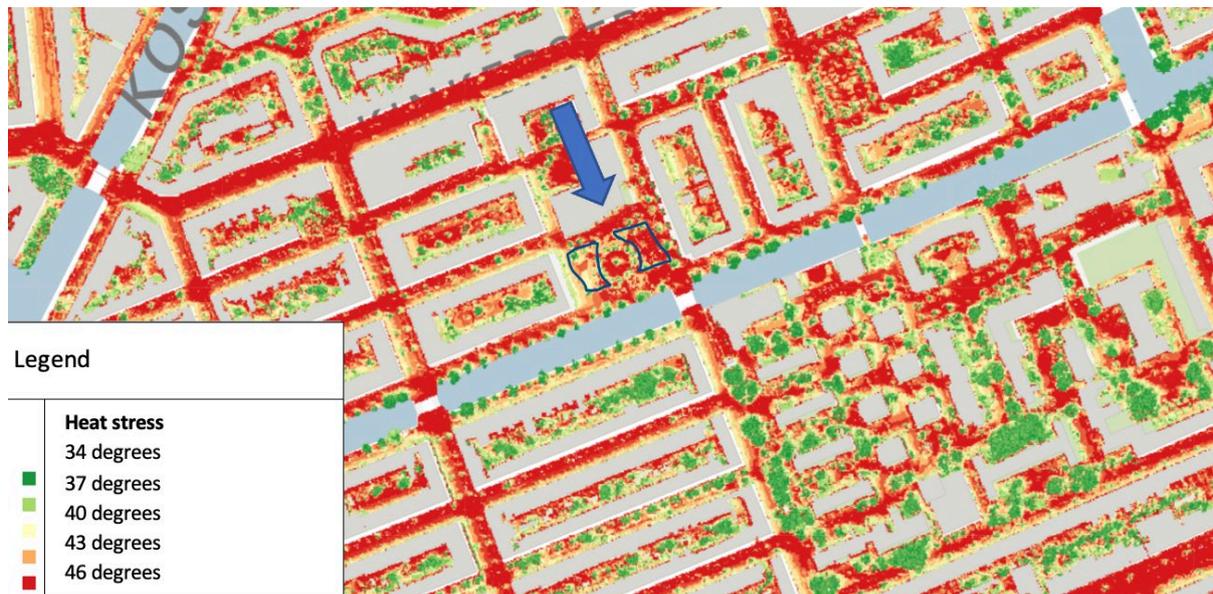

FIGURE 15 HEAT STRESS IN THE NEIGHBORHOOD OF HEP (METROPOOLREGIO AMSTERDAM, 2020)

According to LZP-P02 the impact of the initiative is "not directly, but in the way they work and the way they have improved the neighborhood, we can say that they tackle climate change." This is because it creates awareness about the importance of green and inspires other residents to start greening initiatives, which will, altogether, decreases heat stress. To achieve this, "broadening the scope of these kinds of initiatives is important. And that has to do with information, being known. If you don't know whether the initiative is from residents, then you are not encouraged to do anything. So that should be clear" (HEP-P07).

Additionally, while heat reduction does not seem to appear on the square, rainwater perception is mentioned as climate adaptive function of the square. "We do notice that the more grass we have on the paths, the better we can handle the rainwater." According to HEP-P05. Additionally, the green kiosk has a green roof, to collect rainwater with which plants can be watered. The gardens also contribute to biodiversity and local food production "In addition to being able to grow fruit on a modest scale, the plan for the orchard is also a way to create a true paradise for bees" (Van Bochove et al., 2017a).

7.1.2   Wellbeing

The initiative has significantly increased the livability of the square. More people visit the square, the community officer is happy because there is less vandalism, the qualitative green makes people who walk by it happy and people who work in the garden have met new people and gained a place to relax in green.

7.1.2.1 Social meeting place

"In addition to what they do with gardening, this project has acquired a considerable social function. Getting together every Sunday morning is important to many people" (HEP-P01).

This initiative has the purpose of increasing social wellbeing, both for the gardeners as for the broader residents of the neighborhood. The initiator "wanted to create something for the community" (HEP-P02). Various social cohesion-promoting aspects are reflected in the vegetable garden: growing food together, implementing one's own idea, mutual involvement, networking, social contact, eating and gardening (Van Bochove et al., 2017b). The joint management of the garden is especially important because it requires constant contact. "She did not want individual plots. That is also something that really affected the social cohesion inside the neighborhood and among the gardeners itself" (HEP-P02). In this way, the initiative tackles loneliness in the neighborhood. "We are very important for a number of women who live alone. Especially in these times during the Covid-19 pandemic" said HEP-P05. Which is in line with what the initiative aimed for: "Residents from the same neighborhood get to know each other more easily. Gardening outside can even be a way for some (immigrant) women to get out of social isolation." (L. Witmondt, personal communication, November 10, 2015) The initiative has been effective in getting lonely elderly women out of isolation, however, not immigrant women, as they do not work in the garden (observation, May 9, 2021). The initiative does not only function as a social meeting place for the gardeners, but for the entire neighborhood. "She's really engaging the community. Also, not only for the ones that are working in the garden." "It has created a new square and the people just go there to see flowers, but also just to talk to them" Said HEP-P02. The open design of the garden is identified as important factor in community involvement.

7.1.2.2 Relaxation and stress relieve
"It is a very quiet and nice square, meeting here is peaceful." – HEP-P06

HEP functions as a place for stress relieve and escaping from daily routines, both for the gardeners and for the entire neighborhood. People sit on the benches and pass by. Residents become more aware of their own responsibility and appreciate the greenery in the neighborhood. "The whole appearance of both gardens has become so good over the years that people like to come to the square, and there is less vandalism and more greenery" (Witmondt, 2021). In this, HEP is highly valued by the neighborhood (Gebiedsteam Oud-West, 2019). "It has become a *detour garden*; people make a detour to cycle through the garden on their way to work, because it makes them happy." (HEP-P05). It also increased the quality of living around the square. "Imagine who all live here and look out onto this. They are all happy." (HEP-P05).

Gardeners like to be in green and learn about it. HEP-P04 said "It makes me very happy. I think that is just because of the whole process of blooming and growing." Moreover, some 'severely depressed' people work in the garden "It is part of their solution to be a part of this" (HEP-P05).

TABLE 15 DISTRIBUTION HEP

MEASURE	INDICATOR	RATE	EXPLANATION
Less heat stress	Trees present to provide shade	+	30 (small) trees
	Presence of water	- -	No waterpoint
	Cooler temperatures than surroundings	-	Not perceived as such, trees provide some shade
More wellbeing	Good quality of the green space	++	Very well maintained
	Relaxation	++	Garden is used for this purpose
	Social meeting place	++	Main purpose of the garden
	Stress relieve	++	Garden is used for this purpose

7.2 Procedures

7.2.1 Principled engagement

The main stakeholders of this initiative are residents and the municipality. All residents live in the neighborhood since this is a requirement of the funding body of the initiative. Additionally, the recently built green kiosk has connected various (environmental) organizations (Lalleman, 2021). The school does not play an active role in the initiative, because they do not have time for this, according to HEP-P01 and HEP-P05. The kids of the school are, however, predominant users of the square during the weekdays. Additional party involved is the riding school around the corner as horse manure supplier. Excluded potential stakeholders are the community organizations and (local) businesses. Additionally, the gardeners are no equal representation of the neighborhood, but the visitors of the square are. The gardeners are predominantly elderly women from Dutch origin. There are some people with a western migration background, but people with non-western migration backgrounds are not represented, while the initiative aims for equal representation. "It is of course our intention to have the most possible varied group of participants, varied in age, cultural background, experienced and inexperienced gardeners, etcetera" (Van Bochove et al., 2017a). The misrepresentation has not gone unnoticed. "To involve people from different cultural backgrounds is still a challenge. We do have many women and men, Turkish, Moroccan, Portuguese, Brazilian and Surinamese, who like to take a bag of vegetables home with them. And there's plenty! But actively participating in the garden is a step too far for most. We do have a number of active children and young people with diverse cultural backgrounds" (Van Bochove et al., 2017b). On the other hand, the central location and easy approachability are important success factors when it comes to inclusion on the square (observation, May 9, 2021). **"**Often when you are in the garden in the afternoon or evening, a neighbor comes by. They usually go home with lettuce, a bunch of chard or whatever, and an invitation to join the garden" (Gebiedsteam Oud-West, 2019).

Discovering and defining common objectives was easy. "I wanted to grow food together in the center of the city. So that was kind of a dream. My mantra was: I want to grow potatoes in the Kinkerbuurt." The initiative has succeeded in this. Additionally, it has transformed the formerly dilapidated square into a meeting place for the entire neighborhood and abroad, which was in turn the main objective of the municipality and the reason why they received money from the *regiegroep.* Continuous joint deliberation has been crucial in this initiative. The persuasiveness of the initiator caused the initiative to be enacted within a limited timescale. She also effectively

involved a relatively large number of enthusiastic co-maintenance gardeners and convinced the school, who was pessimistic in the beginning because the garden is situated on its playing ground. Deliberation on co-maintenance, fences, accessibility, information provision and soil quality between municipality and initiators was all needed before the initiative could be approved. "And what happened next was phenomenal. March 6 the bulldozer arrived. March 7 the soil arrived. March 8 we had a garden" (HEP-P05).

7.2.2   Shared motivation

The municipality had little trust in the beginning, but the initiative has gained trust because of the great success. There is a mutual understanding that the garden is of great importance for the neighborhood. This is because of, but also enhances commitment and legitimacy.

This initiative is a good example of how trust and mutual understanding can lead to legitimization of actions. In the beginning, the municipality had little trust in the success of the initiative, because of the history of abandoned citizen-initiated vegetable planters and gardens. The municipality was afraid that "at some point we have to clean it up again, because then it will not be maintained and it does not fit in our subsidies to keep up with that" (HEP-P01). However, because of effective advocacy of the initiator and her prominent role in the neighborhood, she gained trust among civil servants of the municipality. The latter also helped her to find enthusiast residents who were willing to sign a co-maintenance contract. They, in their turn also trust her because of her knowledge on green. "They have recognized that she was the one that initiated the garden, that she made the project, that she's the most knowledgeable in gardening" According to HEP-P02. This all legitimizes the head gardener's prominent authority.

Commitment of residents is crucial for the success of this project. The underlying reasons for commitment of residents are the feeling of ownership and (therefore) pride (HEP-P05, HEP-P07), the community feeling that is created and the low threshold to participate. "The warm and unwavering attention of a few residents is wonderful. It's their project." said HEP-P07. Additionally, "they also engage with the broader community, not just with the gardeners." (HEP-P02) which causes a community feeling in a broad sense. Because of this, there is a mutual understanding within the neighborhood that the garden needs to be protected (Van Bochove et al., 2017a; Witmondt, 2021). In the beginning the garden was vandalized or robbed at times. But now that barely happens anymore. The strong community feeling contributes to his.

Mutual understanding of the role of the municipality lacks among some gardeners, who feel like they are doing the job of the municipality and save them money because they are maintaining the square for the municipality. The municipality, however, facilitates the project. This shows the importance of delegation, shared leadership and good communication to gain mutual understanding, so that gardeners know about this. That would increase the legitimacy even more.

7.2.3   Capacity for joint action
> *"It has an organic slow growth, but that suits the way of gardening."* – HEP-P07

Little formal procedural and institutional arrangements exist within the garden because the head gardener does not want to institutionalize the initiative, out of fear of bureaucracy. This would slow things down and make thing more complicated than they need to be. "I don't want a

foundation. I don't want a partnership and no boards. And that works." (HEP-P05). HEP-P07 acknowledged this helps to get initiatives of the ground faster because "if the municipality initiates something, it is usually in the context of a reprofiling project and that has a much processing time." Formal arrangement between the initiators and the municipality do exist. A co-management contract, signed by fifteen residents in the enactment of the initiative and the rule that only people who live in the neighborhood can participate, because it is funded by a neighborhood budget. The lack of formal arrangements within the organization makes decisions to be taken faster, which makes the initiative non-bureaucratic. The arrangements between the municipality and the initiative set important boundary conditions for successful maintenance and in-/exclusion of participants.

The head gardener is the stakeholder with most knowledge, who generates financial resources and is in the lead of, among others, procedural and institutional arrangements. "She knew how to build a business model; she knew where to get the funds and she knew people inside the community and municipality" HEP-P02. The success and well-known status of the initiative contributes to the easiness of obtaining financial and material resources. This makes the initiative dependent on the head gardener and endangers the long-term sustainability. The importance of spreading leadership and knowledge is acknowledged by the gardeners. "It would be good if a team of people is created who just know how to run this all" According to HEP-P04. Additionally, more people taking decisions, could result in a more diverse group of represented stakeholders.

The initiative does contribute to accessibility to knowledge, leadership and resources for other residents who want to start a greening initiative. The head gardener is often requested by the municipality, greening organizations and citizens to spread her knowledge on green and how to start an initiative. "More and more initiatives in the neighborhood arise and ask us if we want to help to plant or green gardens that are currently neglected" (Witmondt, 2021). This, once again, shows the need for dividing tasks, because the head gardener does not want to spend too much time on this and does not want to get involved in organizations.

TABLE 16 PROCEDURES HEP

MEASURE	INDICATOR	RATE	EXPLANATION
Principled engagement	In- exclusion of all relevant voices	+	(Little diverse group of) residents, municipality and green organizations included but not community centers and local businesses
	(In- exclusion in) Iteration of discovery, definition, deliberation, determination	-	Big role for head gardener and
Shared motivation	Mutual understanding and trust → legitimacy	++	Very legitimate because of trust and mutual understanding
	All relevant stakeholders feel commitment to the initiative	++	All stakeholders are committed
Capacity for joint action	Existence of procedural and institutional arrangements	-	No intra- and little inter-organizational arrangements
	Participants have equal access to knowledge, resources and leadership	-	Relies on head-gardener

7.3 Recognition

7.3.1 Cultural needs, wants and concerns

The initiative is situated in a multicultural neighborhood, which is reflected on the square, but not in the group of gardeners (observation, May 09, 2021; HEP-P05). Various reasons for this are the initial group of gardeners that mainly consisted of older and white women, the effort that needs to be put in actively including people of different cultural backgrounds and the communal rather than individual plots. Even though little dissatisfaction is expressed about the absence of multiculturality, it does increase the risk of the already increasing segregation in the neighborhood to further expand.

Because a small variety of cultures exist and the garden is initiated by a group of older, white women and men, it is not likely that people of different cultures will feel motivated to join the group of gardeners. Additionally, a variety of cultures is not actively tried to engage in the garden (HEP-P05, HEP-P07). The head gardener is hesitant in actively engaging volunteers of community centers, who are a very multicultural group. She said, "So I could actually start working with the Havelaar and with the ABC[33]. But I do not know if I want to take that road. Because I don't want to become the manager of five volunteer groups. It needs to stay fun for me." Noteworthy is that the official of the municipality assumes that they are involved, because she finds interculturality important. "I also said that I think it is important to also include these groups with you. Many of these people with this background have a lot of affection with gardening and growing crops. So

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[33] Community centers in the neighborhood

try to take them along and encourage them to pick up on this and participate." This shows again that the presence of one head gardener does not foster environmentally just greening. In- or exclusion of voices are dependent on her actions.

The communal rather than individual plots undermine the needs and wants of people with non-wester migration background. A Syrian refugee said "It is very simple. You do not work for Willem-Alexander. You do not work for Assad. Yes, that is very basal. You do not work for the government. It is municipal land. You do not work in that. That is deeply embedded. A plot of your own, okay, but not in this way." Other conversations with Syrian people on the square made visible that they like the garden but they do not like working there, because they want to grow food for their own (Observation, May 5, 2020). Their needs and wants are not met in the garden.

7.3.2   Socio-economic needs, wants and concerns

HEP is a very good example on how a good socio-economic situation is needed to set an initiative like this in motion. On the other hand, it also exemplifies that even though not everyone might be capable of initiating an initiative like this, that does not mean that not everyone can reap the benefits.

Many stakeholders acknowledge the capability of the head gardener as important reason for the initiative's success (HEP-P01, HEP-P02, HEP-P03, HEP-P04, HEP-P06, HEP-P07). She has a lot of contacts within the neighborhood and municipality, is high educated, knowledgeable on gardening, knows how to write a *buurtbuget* request and has run a business so is capable of managing (people in) a garden. HEP-P01 identified a recurring pattern that people like the head gardener of HEP requesting *buurtbudgets.* "There are many Surinamese women who organize other things. More from their own background, Keti Koti festival, things like that. They knock on my door and I tell them to come up with a good plan, I help them with subsidy application. I really must help them a lot to get that done. So, they really have a disadvantage when you compare it with someone like HEP's initiator. You must follow that and that route and that subsidy system and you have to log in with DigiD and that is quite a barrier for some population groups." HEP-P06 also acknowledges that you need to invest time in it, which some people might not have. The interviewee sees an important role for the municipality in providing information and support for those who need it most, which is currently absent.

HEP nevertheless addresses socio-economic needs, wants and concerns well. The neighborhood is relatively poor, especially if you compare it to the surrounding neighborhoods (HEP-P01; observation, May 9, 2021). Therefore, there is no financial boundary to participate in the garden; participation is free and all harvest is shared amongst the gardeners. People who walk by also receive some vegetables if they want to. "A lot of poor people live here. Lonely people, that's all part of it. And what we try is, the enthusiastic passers-by also get to enjoy harvest in the summer. And because I know people better, I now also know where the financial weaknesses are" HEP-P05. Additionally, a lot of people working in the garden deal with physical or mental issues. This is no problem, since everyone's needs, wants and limitations are very well considered because of the care of the head gardener and strong community feeling among residents. HEP-P05 is even considering starting a garden designed for people in a wheelchair.

HEP-P06 argues that the predominant group not participating in the garden are the people who recently bought houses – which were social housing apartments before. Mainly because they have their lives elsewhere or attach much value to their own house and rather stay there instead of on a public square, whereas the people who live in social housing are less materialistic about their own house, have fewer outside activities and holidays and therefore feel more connected to the neighborhood and are more likely to participate in the garden. This shows that low socio-economic status is not a barrier to participate in this garden, but rather whether a feeling of commitment to the neighborhood is present or not.

Concluding, socio-economic needs and wants are well addressed but different cultural needs and wants are less addressed. Where the first one is no barrier to participate, the latter is. This having said, a low socio-economic status is often combined with non-western cultural backgrounds in the neighborhood, reflected in the many people with non-western migration backgrounds living in social housing. This stresses the importance of combining the two aspects.

TABLE 17 RECOGNITION HEP

MEASURE	INDICATOR	RATE	EXPLANATION
Recognition of different cultural and socio-economic needs, wants and concerns	Cultural needs, wants and concerns are acknowledged and anticipated on	-	Garden does not meet the needs of people with non-western migration background
	Socio-economic needs, wants and concerns are acknowledged and anticipated on	+	Free to participate, socio-economic vulnerable people are actively included
	Processes underlying exclusion are tried to be tackled	-	Actively engaging more vulnerable people, but not the people with non-wester migration background
	Everyone feels welcome in the green space	-	Not in the garden, but on the square

7.4 Relation between distribution, procedures and recognition

HEP is developed at the beginning of the municipality's shift towards area-oriented work. The acknowledgement that citizens might know better is an important shift towards more just urban planning, because it considers the needs and wants of residents more than the traditional way of urban planning, where the municipality plays we-know-what-is-good-for-our-residents role. The municipality plays a supportive role to facilitate citizens in designing HEP. This initiative enhances just urban greening in Amsterdam mainly because it serves as source of inspiration for more collaborative citizens-initiated greening initiatives to arise and has increased the livability of the neighborhood. The dominant role of the head gardener plays an ambiguous role in this, since her role is crucial in the success of the garden, in terms of outcomes. However, it makes the initiative very dependent on her, resulting in lack of equal representation and incorporation of needs and wants of different cultural resident groups. Additionally, it causes the initiative to be endangered longer-term sustainability. The initiative exemplifies how strong a socio-economic

situation, knowledge, resources and skills are key conditions for setting collaborative just environmental greening in motion. The positive distributive effects of the initiative amplify the importance to make it possible to initiate a greening initiative in a collaborative way. Initiating and participating, however, should become better accessible for everyone, no matter their socio-economic or cultural identity, and not dependent on one single person.

8. DISCUSSION

In this chapter 8. Discussion, the results of the three case study's are presented in Table 18, is briefly elaborated on (8.1). Then, the results of the case study's are contextualized against literature (8.2) after which the diagnostic framework that has been developed throughout the research based on the literature and empirical findings is presented (8.3). Finally, limitations of the research are discussed and suggestions for further research are given (8.4).

8.1 Comparison of the case studies

Table 18 depicts that all three collaborative urban greening initiatives under study have positive distributional effects, especially because they increase wellbeing in the neighborhood and trees are present. Procedural justice is predominantly enhanced in shared motivation. Recognition was less observed.

TABLE 18 COMPARISON OF THE CASE STUDIES BASED ON ANALYTICAL FRAMEWORK

VARIABLE	MEASURE	INDICATOR	RATE LZP	RATE ZBT	RATE HEP
Distribution	Less heat stress	Trees present to provide shade	+	+	+
		Presence of water	- -	- -	- -
		Cooler temperatures than surroundings	+	+	-
	More wellbeing	Good quality of the green space	-	++	++
		Relaxation	++	+	++
		Social meeting place	+	+	++
		Stress relieve	+	-	++
Procedures	Principled engagement	In- exclusion of all relevant voices	+	+	+
		(In- exclusion in) iteration of discovery, definition, deliberation, determination	+	+	-
	Shared motivation	Mutual understanding and trust → legitimacy	-	++	++
		All relevant stakeholders feel commitment to the initiative	-	+	++
	Capacity for joint action	Existence of procedural and institutional arrangements	+	+	-
		Participants have equal access to knowledge, resources and leadership	-	-	-
Recognition	Recognition of different cultural and socio-economic needs, wants and concerns	Cultural needs, wants and concerns are acknowledged and anticipated on	-	- -	-
		Socio-economic needs, wants and concerns are acknowledged and anticipated on	-	-	+
		Processes underlying exclusion are tried to be tackled	- -	- -	-
		Everyone feels welcome in the green space	+	-	-

All three initiatives (will) have positive distributional effects. Mostly directly in terms of social wellbeing. The creation of a social meeting place and relaxation and stress relieve are deemed important effects. Heat reduction is addressed very locally by provision of shade, but other positive environmental functions such as biodiversity, local food production and, decrease wind hinder and water intake are also experienced as important distributional effects. This having said, collaborative initiatives under study are rather small, causing the initiatives' environmental effects to be local and mostly indirect, by increasing awareness and motivating others to start a greening initiative. Good quality of the green space is a key condition for both distributional effects to come about, as observed in HEP and ZBT, and afraid not to be preserved in LZP. This links to underlying procedures and notions of recognition.

The collaborative nature of the initiatives caused an inclusion of a wide variety of stakeholders; municipality, community organizations, greening organizations and residents. Potential stakeholders left out across cases were (local) businesses and schools. Additionally, in the initiatives where residents were in the lead of final decisions (ZBT and HEP), it has become apparent that the procedures meant to include a broader variety of residents, fell into oblivion. In the case of ZBT this refers to the inclusion of plots for people with a city pass; in the case of HEP it refers to the inclusion of community centers, which are predominantly visited by people with non-western migration backgrounds. Neither of the groups participate in the initiatives now. This is problematic because the results of HEP show that including lonely people increases their wellbeing maybe even more than socio-economically stable people. This leads to conclude that first of all, the inclusion of these voices is no (main) priority of the initiating citizens, nor of the other initiating stakeholders. Second of all, including a more diverse range of residents asks for specific attention and cannot be expected to happen automatically. This stresses the importance of collaboration in all stages of the initiative (planning, enactment and maintenance) and embedding in- and exclusion of all relevant voices, especially minorities, in procedural and institutional arrangements.

Different levels of participation and collaboration between stakeholders exist. In LZP the municipality has a strong leadership role, whereas in HEP and ZBT residents play a more dominant role. The purpose of participation of, and collaboration between various stakeholders is to create a feeling of ownership, because this contributes to (co-)management of the green infrastructure and thus more sustainability in the future because of increased distributional effects and quality preservation. This argument is validated because the self-maintenance is HEP and ZBT in no problem, where shared motivation is very high, while for LZP, where shared motivation is lower, little enthusiasm for (co-)managing the green exists. Comparing the case study's thus reveals that mutual trust, understanding and commitment and equal access to knowledge and resources are preconditions for effective collaborations and sustainable greening initiatives. The other way around, effective collaboration also enhances and accelerates trust, understanding and commitment.

Recognitional justice issues underly the (un)just procedures of the collaborative urban greening initiative under study. The importance of trust, mutual understanding, commitment, resources (financial, material & skills) and knowledge is important for a sustainable greening initiative. It has become apparent that in the case of a stable socio-economic situation of the residents with a leading role (HEP & ZBT), there is more trust, commitment and mutual understanding between them and the other stakeholders involved. Additionally, when they are of the same culture,

misunderstandings in this regard, as mentioned by LZP-P04, do not occur, which affects mutual trust, commitment and understanding. This results in for example the arrangement of (co-) maintenance contracts in the case of ZBT and HEP, and not in LZP. The latter is situated in the most multicultural neighborhood with the lowest average income. The difficulty in creating co-maintenance in LZP has another reason, being that it is not initiated by residents, but by the municipality. This creates less ownership feeling than in the cases of HEP and ZBT. Initiating a greening initiative also requires knowledge (on for example who to reach out to and how to apply for a *buurtbudget*), resources in terms of time to be able to spend, commitment and gaining understanding. Additionally, the limited time and recourses also make them less likely to be able to participate. Taken all of this together, leads to the conclusion that cultural and socio-economic differences and inequalities thus need attention, for collaborative urban greening initiatives to enhance environmental justice.

8.2 Contextualization of cases against literature

By critically scrutinizing collaborative urban greening initiatives in Amsterdam through an environmental justice lens, this research explored how CUP can enhance more just outcomes and procedures, and address structural inequalities i.e., how distribution, procedures and recognition play out. Four most important issues from the findings are presented and contextualized against literature.

8.2.1 The importance of quality preservation

First, CUP has the potential to lead to quality and quality preservation of the greening initiatives by residents, which enhances just outcomes. Positive distributional effects of urban greening only reflect when the green infrastructure is of good quality. Regarding heat reduction, trees must be healthy and mature to provide shade and a cooling function. Especially in times of drought, they provide a better cooling function than grass, which dries out faster (Gill et al., 2007; Jonker et al., 2014) found that 1% increase in green surface in a neighborhood in The Netherlands increases life expectancy with 0.1 year and has no significant effect on healthy life expectancy, whereas 1% increase of quality of green leads to 0.3 year higher life expectancy and 0.3 year increase healthy life expectancy. Additionally, qualitative green space contributes more to creating awareness on the importance of green infrastructure (Brink & Wamsler, 2018), which has proved to be an important outcome of CUP in this research.

Quality preservation is thus very important to maintain the heat reductive and wellbeing increasing distributional effects of urban greening. In Amsterdam, results show that areas with lower socio-economic status surprisingly are the relatively greener districts (Municipality of Amsterdam, 2020a). However, green in these neighborhoods is also often less well maintained (Pellerey, 2021). Research has shown that there is a pattern of poorer quality, less maintained, sparser and smaller green areas in lower income neighborhoods in city's (Anguelovski et al., 2020, Boone et al., 2009, Dadvand et al., 2014).

CUP enhances quality preservation by residents because it creates a feeling of pride, mutual understanding and co-ownership. Because of CUP, knowledge, time and resources of residents and local organizations is used. This enhances just outcomes because when citizens maintain the green area, more money can be attributed to the green infrastructure because less money is needed to be spent on maintenance by the municipality (Brink & Wamsler, 2018). Even though

co- or self-management is important for green space protection, management and social values, Mattijssen et al., 2017 highlight that "this contribution is mostly of local relevance" (p. 96), because of the small size. Smaller pocket parks such as the green areas studied in this research have less environmental benefits than bigger parks. However, bigger green areas might feel unsafe, especially when mal maintained in underdeveloped neighborhoods with high crime rates (Anguelovski et al., 2020).

8.2.2   The importance of the initiating stakeholder(s): who they are and their intentions

Second, structural inequalities determine the initiating stakeholder(s), and the priorities and intentions of the initiating stakeholder(s) influence just procedures and outcomes. Who the initiators of collaborative urban greening initiative are and what their intentions and priorities are (existing inequalities, who to involve, accessibility, purpose of green, considering marginalized people, rules and regulations, climate change adaptation) determines if and how CUP enhances just urban greening. This holds for whether it is initiated by citizens, state, local organizations, or market, as well as 'who' the citizens are.

Collaborative climate adaptive planning initiatives can (unintentionally) exclude certain groups (Brink & Wamsler, 2018; Galvis, 2014) from participating. It is observed in this research that inequalities in initiating such initiatives are also existent. There is a shift from state to private actor initiated greening initiatives (Bisschops & Beunen, 2018, Mattijssen et al., 2017). The role of the state, in this research the municipality, shifts from a leading to a facilitating one (Bakker et al., 2012; Mattijsen et al., 2017; 2018). This may have positive distributional effects and creates a better incorporation of socio-economic needs wants and concerns in greening initiatives, because they are initiated by the ones who make use of it (Hawinkgs & Wang, 2012; Innes & Booher, 2007). Additionally, organizations are an important intermediary between institutions and citizens (Hawkins & Wang, 2012) and connect the needs and wants of the residents with the policies and regulations of the municipality. They take away responsibilities from cities as well as municipality, which alleviates institutional boundaries and lowers the threshold to start an initiative (Warbroek et al., 2018). This can therefore lead to more just procedures because it creates a possibility for more people to start an initiative, also those with limited time, knowledge and resources. This enhances more equal representation of all residents in the neighborhood, because the initiators often start an initiative within their own 'community'. However, this is only to a certain extent observed in this research.

Prioritization of just climate change adaptation is important because a "tension between balancing the procedural implications of strategic planning and the more normative priorities of tackling entrenched political economic interests" (Chu et al., 2017, p. 384) is often observed. Collaboration between the municipality, social and greening organizations and citizens increases climate adaptive outcomes because residents often do not actively bring attention to climate adaptation, while the municipality and greening initiatives do (Mattijsen et al., 2017; Mattijssen, Buijs & Elands, 2018). On the other hand, citizen-initiated initiatives can also foster climate adaptive outcomes, because of co-management and increased awareness (Brink & Wansler, 2018). Additionally, initiatives that do actively address inequalities and pay attention to equitable representation do include a more diverse range of citizens (Pagano, 2021; Ankobrey, 2015).

Thus, citizen initiated, but in close collaboration with municipality and organizations that specifically attribute attention to environmental justice is the first step towards more just urban greening, because it increases the potential of the initiative itself, as well as inspirers other citizens to start initiatives, by increasing awareness. CUP then enhances just outcomes, fosters just procedures and recognizes inequalities when this is the intention of the initiating stakeholder(s) and boundaries to start an initiative are overcome.

8.2.3 The importance of recognition

Third, recognition should serve as a starting point for CUP to enhance just urban greening, to make sure structural inequalities are actively addressed and the initiative meets socio-economic and cultural needs, wants and concerns. When incorporating recognition, just outcomes and procedures are more likely to naturally follow. Recognizing inequalities is very limitedly observed in this research, while it is widely discussed in literature as important dimension (Fraser, 1995; 1997, 2008; Schlosberg, 2013; Young, 1990) or entry point ("the perspective of recognition emerges as a particularly useful entry point through which to explore the types of rights, responsibilities, distributions and procedures required to respond justly to climate change" (Bulkeley et al., 2014, p. 31)) for environmental justice.

This having said, CUP does address different needs, wants and concerns more than top-down municipality implemented green infrastructure (policies) (Pellerey, 2021), exemplified by the fact that it is not referred to in Amsterdam's *Groenvisie 2050* (Ivens, 2020). Nevertheless, CUP does not structurally address existing inequalities either. Inequalities are acknowledged, but rarely anticipated on throughout the planning, enactment and maintenance phases of the initiatives. It is for example apparent in the capacity to initiate and preserve quality. CUP only enhances just greening in all three pillars when the socio-economic status of the neighborhood is considered. Otherwise, as is exeplified in the difference between co-maintenance capacity between residents in LZP and HEP on the one hand and LZP on the other hand, greening initiatives in neighborhoods with a lower socio-economic capacity are less likely to enjoy the positive distributional outcomes of collaborative greening initiatives.

Problems of misrecognition are often solved as problems of maldistribution (Fraser, 1995), which does not solve segregation in urban greening initiative participation. Examples from this research are that the uniform image of the gardeners is tried to be solved through making some plots more expensive than others, in the case of ZBT or plant fruit trees to attract people with non-western migration backgrounds in the case of HEP. This has clearly not resulted in a more equal representation of the neighborhood. The recurring pattern of unfulfilled promises on inclusion of different cultures and socio-economic groups observed in the case studies correlate with Veen (2015), who found that community gardens mainly (unintendedly) attract people with similar socio-economic backgrounds. Additionally, procedures are often not found to be equal either, as tenants are for example less likely to influence climate adaptation than homeowners (Brink & Wamsler, 2018). Therefore, addressing existing inequalities is needed to overcome segregation and shift the focus towards the needs, wants and concerns of everyone (Bulkeley et al., 2014, Chu et al., 2017, Pellerey, 2021). This is also important to prevent the possible consequence of green gentrification from happening (Anguelovski et al., 2018; Chu, et al., 2017; Dooling, 2009; Gould & Lewis, 2017; Wolch et al., 2014).

8.2.4   The importance of institutionalization

Fourth, institutionalization of environmental justice in collaborative urban greening initiatives through constructively recognizing existing inequalities, considering just procedures and outcomes fosters the potential of CUP to enhance just urban greening. This logically leads from the previous issues, because institutionalization in municipality's and organization's policies and arrangements makes just outcomes in greening initiatives less dependent on the stakeholder(s) who start the initiative and the extent to which they and stakeholders involved are motivated to contribute to just urban greening. This can be executed by for example including it in allocating buurtbudgetten. Because strategic climate adaptation actions, resulting from policies and visions often lack the capacity to prioritize equal outcomes, these actions "must be considered in relation to the powerful, and often entrenched, political economic interests that constrain urban equity at-large (Chu et al., 2016, p. 378). This asks for a need of monitoring and institutionalizing environmental justice in CUP throughout planning, enactment and maintenance phases.

Den Exter, Lenhart & Kern (2015) argue that "structural integration of climate mitigation and adaptation is limited in Dutch cities" (p. 11062). The municipality of Amsterdam does have visions and policies on urban greening and climate adaptation. However, in line with Aylett (2015), municipality's climate change adaptation planning is driven by individuals or small recently formed units that often have more limited jurisdictions and fewer resources than other municipal bodies. In this research, these municipal bodies are observed to have little authority and mandate. Thus, "climate change planning is working from a position of relative institutional weakness" (Aylett, 2015, p. 13). It has been found that this hinders just outcomes, because less money and time is spent on greening initiatives, which limits its climate adaptive functions. This is reflected in that, despite the significant positive outcomes citizen's engagement has for local climate adaptation, efforts are very limitedly supported and channeled by municipalities (Brink & Wamsler, 2018). Additionally, attention to just procedures is limited and recognition of existing inequalities is absent in the municipality's green and climate adaptation visions (Pellerey, 2021). Consequently, recognition of inequalities and citizens' needs, wants and concerns is only reflected in the studied collaborative urban greening initiatives to a limited extent and just procedures are very dependent on the capability and priorities of initiators, which does not ensures long term sustainable greening initiatives.

8.3 Diagnostic framework

The diagnostic framework, depicted in Table 19, pulls together the analytical framework and the main empirical findings. The questions in the framework are meant to bridge the theoretical and empirical findings of this research with a practical relevant approach, by guiding a focus of enquiry towards just urban greening for initiators of urban greening initiatives. Before using the framework, the user should identify whether the initiative is indeed a collaborative urban greening initiative. Additionally, the arena in which the imitative is situated should be considered, because this influences the initiative. The framework starts from a notion of recognition, as this is identified to be a good entry point through which first procedures and then distribution can be explored. Two cross-dimensional questions regarding institutionalization and the importance of continuous reflection throughout planning, enactment and maintenance are added in the end, because they are deemed important for CUP to enhance just urban greening.

TABLE 19 DIAGNOSTIC FRAMEWORK

First: Identify whether it is a collaborative urban greening initiative	1. Is it a greening initiative? → It is if it greens the city by planting any type of greenery 2. Is it a collaborative urban planning initiative? → It is if it is established through bottom-up planning, in collaboration with different stakeholders and influences the public realm				
Second: Identify the arena in which the collaborative urban greening initiative plays	1. Location 2. Environmental factors[34] (average temperatures, periods of drought, air quality, heath, green space etc.) 3. Demographics (age groups, cultural backgrounds, income, education levels) 4. (Potential) Stakeholders[35] 5. Institutional factors[36]: (formal) rules, regulations, policies that possibly affect the initiative in its planning and enactment				
From here: move on to diagnose if and how the collaborative urban greening initiative is environmentally just i.e. if and how CUP enhances just urban greening here					
	Diagnostic question	Does not enhance just urban greening	Barely enhances just urban greening	Enhances just urban greening	Enhances just urban greening considerably
Recognition: consider the following three questions about structural inequalities throughout the rest of the framework	**Think about what structural inequalities[37] exist in the neighborhood where the greening initiative is situated. What does the initiative do to tackle this?**	Inequalities are not considered and not tried to be tackled	Inequalities are considered but not tried to be tackled, because no actions are taken[38]	Inequalities are considered and acted upon[39]	Inequalities are considered and tackling these is the (main) purpose of the initiative. The planning, enactment and maintenance is adopted accordingly[40]
	What are the dominant cultures in the neighborhood? Are the cultural	Different cultural needs, wants and concerns are not recognized and inequalities in this regard are ignored	Different cultural needs, wants and concerns are not recognized and inequalities in this regard are	Different cultural needs, wants and concerns are recognized and inequalities in this regard are acknowledged	Different cultural needs, wants and concerns are recognized and inequalities in this regard are

[34] for The Netherlands can be found here: https://www.atlasleefomgeving.nl/check-je-plek

[35] Private and public: municipality, other (local) government authorities, (local) businesses and entrepreneurs, market traders, local social and community organizations, greening organizations, residents, visitors, schools etc.

[36] This can be about the greenery (shape, size and type) and the collaboration, but also and very importantly on environmental justice, indicating (formal or informal) rules or arrangements on heat adaptation and social wellbeing, equal representation of different stakeholders, just procedures, a need to specifically include marginalized people or take into account existing inequalities and consider socio-economic and cultural needs, wants and concerns

[37] Eg the presence of economic inequalities and this is deemed problematic because segregation exists or it leads to crime, people are pushed away because of increasing rents (gentrification), some residents do not have the same access to resources or activities than others to, cultural deprivation, stereotyping and subordinating cultures, forms of socio-economic marginalization and deprivation, inequal policies that deprive certain cultures or people with lower socio-economic status

[38] Eg. When stakeholders know there is loneliness among a certain group of marginalized people, but the initiative does not try to tackle this

[39] Eg, When the initiative does tackle loneliness by actively engaging the marginalized groups who are lonely

[40] Eg. When the very reason for the greening initiative is tackling loneliness

	needs, wants and concerns recognized?[41]		acknowledged but not tried to be tackled	and to a certain extent tried to be tackled	acknowledged and tried to be tackled
	What is the socio-economic status of the neighborhood? Are the socio-economic needs, wants and concerns recognized?[42]	Different socio-economic needs, wants and concerns are not recognized and inequalities in this regard are ignored	Different socio-economic needs, wants and concerns are not recognized and inequalities in this regard are acknowledged but not tried to be tackled	Different socio-economic needs, wants and concerns are recognized and inequalities in this regard are acknowledged and to a certain extent tried to be tackled	Different socio-economic needs, wants and concerns are recognized and inequalities in this regard are acknowledged and tried to be tackled
Procedures: How just are the decision-making and participation processes of the initiative?	**Who initiates the initiative? What are their intentions and priorities?**	Initiative is top-down initiated by one stakeholder (often the municipality) and does not intent or prioritize recognition of existing inequalities, inclusive procedures and positive distributional outcomes	Multi stakeholder initiated[43], who do not represent the potentially affected[44] and do not specifically intent or prioritize recognition of existing inequalities, inclusive procedures and positive distributional outcomes	Multi stakeholder initiated, potentially affected are represented[45] and do (unintendedly) intent or prioritize recognition of existing inequalities, inclusive procedures and positive distributional outcomes	Multi-stakeholder initiated, potentially affected are represented, who actively intent to enhance just urban greening and highly prioritize recognition of existing inequalities, inclusive procedures and positive distributional effects and has initiated the urban greening for these purposes
	Consider the stakeholders of the initiative. Is this an equal representation of all relevant stakeholders who are potentially affected by the initiative[46]? What	A lot of parties who are affected by the initiative are left out and the residents do not represent the cultural socio-economic	Most potentially affected stakeholders are represented but the residents do not represent the cultural and socio-	Most potentially affected stakeholders are represented and the residents represent the cultural and socio-	All potentially affected stakeholders are represented and the residents represent the cultural and socio-economic situation of

[41] Note that this is especially important in multicultural neighborhoods. Think about: feel responsible to make the green space a place where people of different cultures can come together, in case of segregation in the neighborhood, come up with how to tackle this through the initiative, provide information in different languages so that everyone who can read is able to read it, let people who speak commonly spoken languages show up at meeting or in the area, respect different cultures and come up with ways to take into account different needs

[42] Note that this is especially important in neighborhoods with lower socio-economic status. Think about: tackling the inequalities with regard to having time and money to influence the outcome or participate, in case of payment schedule: let people who can afford it pay more for their community gardens, so that those who cannot afford it receive it for free, or find subsidies, acknowledge that gardening may be a luxury activity for people with spare time, so that groups who have less spare time are being compensated in other ways (through time or money), not too many trees and enough light in places in a neighborhood where overview is needed to prevent crimes from happening

[43] Eg. municipality, local community or social organizations, greening organizations, citizens, (local) businesses, real estate companies

[44] Exclusion of certain (marginalized) population groups, or affected local businesses and organization in the decision-making processes

[45] Note that initiating citizens often include their own community, a broader and more diverse range of citizens engagement is included here

[46] Potentially affected = when they make use of the space that will be/is greened, when the green effects their customer numbers (positive or negative), when they can contribute to the green in a way (think outside the box such as manure from the horse riding school), or benefit from it (when it increases their quality of life, grow vegetables to eat or sell)

	about the residents, do they **represent the cultural and socio-economic situation in the neighborhood?**	situation in the neighborhood[47]	economic situation of the neighborhood	economic situation of the neighborhood	the neighborhood, because specific attention is given to this[48]
	Are stakeholders trusted and mutually understood and (how) does this lead to commitment and legitimacy?	No trust and misunderstandings exist between stakeholders, no feeling of commitment and procedures are not perceived legitimate[49]	Trust issues and little mutual understanding exists, some stakeholders feel committed and procedures are not perceived unlawful [50]	Stakeholders trust each other and no misunderstandings exist, leading to both internal and external commitment and legitimacy exists[51]	Stakeholders trust each other and no misunderstandings exist, leading to both internal and external commitment and legitimacy exists which demonstrably positively affects the procedures and outcomes
	Is there capacity for joint action, by efficiently using[52] and providing equal access to[53] leadership roles, knowledge and resources such as time and money and does this positively affect the outcomes?	No capacity for joint action, indicating unequal leadership and no use of or equal access knowledge and resources of different stakeholders	Some capacity for joint action, because knowledge and resources of different stakeholders is used, but they have no equal access to that nor to leadership	Joint action, with various leading roles and efficient use of and equal access to knowledge and resources of different stakeholders leads to outcomes that could not have been accomplished separately	Joint action, with various leading roles and efficient use of and equal access to knowledge and resources of different stakeholders, especially of the less powerful[54], leads to outcomes that could not have been accomplished separately
Distribution: How just are the outcomes of the greening initiative?	**Does the initiative reduce heat stress, so that it contributes to adapting to climate change?**	No trees, no waterpoint, not (experienced) cooler than surroundings	Presence of trees, but they do not tackle heat stress well because of their size or bad quality, small	presence of qualitative trees and waterpoint and temperatures (experienced)	presence of trees, waterpoint and temperatures (experienced) 6+ °C cooler than surroundings and

[47] Eg. Only white elderly women are represented in a multicultural neighborhood with a lot of young families.

[48] Eg. The inclusion of social organizations that attracts a diverse group of residents, who are not likely to take part in the procedural processes or garden because of their cultural or socio-economic situation

[49] Eg because of a history of ill-fitting urban renewal or broken promises and bad communitcation, note that this is relatively often the case in marginalized neighborhoods and multicultural neighborhoods because language and cultural boundaries limit mutual understanding

[50] An initiative can be dependent on the commitment of one or more motivated stakeholder(s), who merely operate on their own, despite the limited trust and mutual understandig

[51] Internal = procedures are perceived legitimate within the initiative, eg in the case of a community garden that gardeners find decisions of gardeners in charge legitimate and all gardeners feel committed to contribute to the initiative
External = Legitimacy and commitment between stakeholders eg. Citizens perceive the procedural desicinons of the municipality legitimate and all stakeholders feel commited to the process because they trust each other and there is mutual understanding on the importance of the initiative

[52] Eg more money available or use of local knowledge on the neighborhood of residents

[53] Eg multiple stakeholders can take decisions expendiutres, decisions do not lay in the hand of one party

[54] Eg extra time or money compensation is provided to marginalized citizens, so that they can participate in and influence decision-making processes and their voices are heard

			waterpoint, (experienced) max 3°C cooler than surroundings but not perceived as such	3-6 °C cooler than surroundings	initiative inspired others to initiate heat reductive initiative[55]
	Does the initiative address social wellbeing of residents? In other words, does the space function as social meeting place and place for relaxation and stress relieve? In which ways?	It does not serve as a social meeting place, neither does it function as a place for relaxation and stress relieve[56]	It serves as a social meeting place and functions as place for relaxation and stress relieve for some[57]	It serves as a social meeting place, and people visit the green space for relaxation and stress relieve.	It serves as a social meeting place, and people visit the green space for relaxation and stress relieve. It is perceived as important place for this purpose within the neighborhood (and abroad).
	What is the quality of the greening initiative and (how) will the quality be preserved in the future?	Poor quality[58]	Moderate quality[59]	Good quality[60]	Good quality, which is preserved because of systematic maintenance, which is likely to be sustained in the future[61]
Final overlapping:	Are any of the answers to the previous questions affected by institutionalization?[62]	No	Some	Most	All
	Do the answers hold for the planning, enactment and later maintenance of the initiative?	No	Yes, for one out of three	Yes, for two out of three	Yes, for all three

[55] Other citizens, organizations or municipal bodies are inspired by the initiative thanks to the collaborative nature of the initiative, because it has created social support and publicity

[56] In case a green space is abandoned and neglected

[57] In case the green space is not or only partly freely accessible, there is a (financial) boundary to enter or participate (in case of community garden), there is limited space, some feel excluded because of the design (high density of trees might people feel unsafe because of lack of overview) or because they do not feel represented or there is nuisance of loiterers or alcoholics

[58] Abandoned, rubbish, dog feces, vermin (rats), poorly or not maintained; abandoned, green is in bad state and is in need of care

[59] Plants, trees and flowers are healthy, but little diversity and maintenance

[60] Good quality indicates healthy trees and plants and flowers, well maintained, high biodiversity because of different types of (native) perennials, maybe herbs or other edible plants, existence of paths

[61] Well maintenance is likely to be sustainable when enough money is provided for this, stakeholders attribute importance to the green space, a (co-)maintenance contract is signed in the case of multi-stakeholder maintenance (often between citizens and municipality) and/or maintenance is not dependent on one stakeholder

[62] Indicating that rules, regulations or arrangements set by for example the municipality, the commissioning (greening or social organization) affected the answers or other initiating bodies affected the answers

8.4 Limitations and suggestions for further research

Various limitations might have influenced this research. These limitations are discussed after which suggestions for further research are given.

First, regarding positive distributional effects of urban greening, this research only incorporated heat reduction and social wellbeing. Other climate adaptive functions that could have been scrutinized are drought and water and CO_2 intake. Additionally, physical and mental wellbeing, referring to health could have been assessed. Researching these aspects of urban greening would have resulted in different conclusions regarding the distributional climate adaptive outcomes of urban greening. The decision for two aspects is justified because first of all, scrutinizing two aspects has led to more in-depth analysis. Second of all, heat reduction and social wellbeing are both deemed in regard to environmental justice, because heat reduction is especially important when living in a small, badly insulated house or apartment without garden and marginalized people are often more socially isolated in cities. Third of all, heat reduction is a relatively easy climate adaptive function to do qualitative research on, because it is not only measurable in exact temperatures but also in people's perceptions. This having said, it should be mentioned that there is of course a difference between actual temperatures and people's perceptions. This has been tried to be tackled by the use existing maps of Metropoolregio Amsterdam (2020), which are in turn not always very specific and may be outdated.

Second, several limitations influenced results of the case studies. The cases that are recently developed or still under development were selected because this increased the extent to which interviewees could recall detailed information on planning and enactment phases. However, because ZBT has only been enacted in the end of 2020, which also counts for the green kiosk at HEP and LZP will be realized this fall, some outcomes may not be visible yet. Even though it was very valuable that interviewees recalled the planning and enactment processes well, this should be acknowledged as a limitation. Another limitation was the willingness to participate in this research. First of all, a carefully selected case withdrew from participation relatively late in process. The reason for withdrawment exemplifies the difficulty and sensitivity of researching environmental justice. This case had carefully been selected because it is established to counteract inequalities that women in a developing neighborhood in Amsterdam face. However, because of the precarious situation the gardeners find themselves in, the initiators did not want to 'bother' them with interviews. This is in line with the limitation that those people who do not work in the gardens of HEP and ZBT, who are excluded from the greening initiatives or are unheard in decision making processes were difficult to reach out to in this thesis. This is a paradoxical limitation, because environmental justice research is specifically about these issues of not being able to reach out to certain people. When researching justice and putting emphasize on marginalized people, it is important to give them a voice. Residents, market traders and local businesses on LZP, were however, not successfully included because of language barriers and people did not know or understand why they were approached. This highly differs from the high educated, proud initiators of ZBT and HEP, who were more than willing to be interviewed and easily found others to participate in this research. These limitations were considered when carrying out the research, and tried to be incorporated in the results, to serve as findings rather than limitations.

The diagnostic framework is meant to be applicable to other cities in different western countries. However, the arena in which collaborative urban greening initiatives play out is of course different per country or city. The framework will assumingly be applicable to other cases in Amsterdam, because it is based on both theory and empirical findings in this city, of which the results are tried to be generalized in the framework. Additionally, it will most likely be applicable to other cities in The Netherlands, as the environmental, institutional, cultural, social and economic factors are alike. However, including cases in other cities would have contributed to its applicability in other settings. It is uncertain how differences in these factors will affect the applicability of the framework. This limits the external validity of the diagnostic framework. However, only assessing cases in Amsterdam, increased the richness of the results, because they could be visited and were known by the commissioning organization. Additonally, the framework will be used by the commissioning organization of this research which operates in Amsterdam. Further development of the framework through their usage and their collaboration with organizations in other cities, will unravel and possibly improve its external validity. Future use and development of the framework is therefore stimulated, so that it can be enriched with both empirical and theoretical data.

Suggestions for further research as, as mentioned before, to use and further develop the diagnostic framework, so that it is enriched it with more empirical data and will be better applicable to other cities in different countries. Additionally, further research could elaborate on how to steer CUP towards environmentally just urban greening, because it is believed to be an important plausible manner of urban planning in the enhancement of environmental justice in the urban arena. What measures to implement and how to change governance in a way that environmental justice is institutionalized in CUP is suggested to further do research on. A final suggestion is to scrutinize how collaborative initiatives in the field of urban sustainable development, such as energy transitions, circular building and local urban food systems enhance environmental justice can be studied and diagnostic frameworks can be developed for these issues as well. This is serves both research as practice.

In this research an exploratory multi case study of three collaborative urban greening initiatives throughout Amsterdam is conducted. Qualitative research was employed by semi-structured interviews, content analysis and observation which aimed to assess collaborative urban greening initiatives in Amsterdam critically and thoroughly through an environmental justice lens. The results were compared and combined, and a diagnostic framework was developed to bridge the theoretical and empirical findings of this research with a practical relevant approach, by guiding a focus of enquiry towards just urban greening. The research aimed to answer the following research question: *How can collaborative urban planning enhance more just urban greening in Amsterdam?*

It has been found that collaborative urban planning enhances just outcomes of urban greening, and just procedures to a certain extent, however there is a need for increased recognition of existing inequalities and institutionalization to further pave the way towards just urban greening, which stresses the interconnectedness of the three dimensions of environmental justice. Four important issues have become apparent in this regard.

First, CUP enhances quality and quality preservation of the urban greening. This is because collaboration creates capacity for joint action, which enhances quality, creates shared motivation and involves a wide variety of stakeholders, which plays an important role in quality preservation, because it leads to social support for the initiative and awareness of the importance of green infrastructure. High level citizen involvement in turn creates a feeling of ownership, which causes citizens to be motivated to (co-)maintain the green space and inspires others to initiate or contribute to a greening initiative. This enhances just outcomes, because the social wellbeing increasing and heat reductive functions of collaborative urban greening initiatives are only reflected when it is of good quality.

Second, the identity, priorities and intentions of the initiating stakeholders is important for just procedures and outcomes. Overall, citizens initiated, in close collaboration with organizations and municipality enhances just procedures and outcomes most. This is because it fosters planning and enactment processes, so that the green space is more likely to be designed according to the residents' needs and wants and awareness on the importance of green infrastructure is risen. However, equal representation of all residents is not covered here, as the often socio-economically and culturally privileged initiators start an initiative within their own community and do not actively prioritize inclusion of diverse socio-economic and cultural groups. Thus, structural inequalities determine the initiating stakeholders, especially in the case of a citizens initiated urban greening initiative. Therefore, initiators' prioritization of climate change adaption and environmental justice is important. The latter is not encountered in this research.

This leads to the third issue, being that recognition should serve as a starting point for CUP to enhance just urban greening. This will increase the likelihood that structural inequalities are addressed and the initiative meets socio-economic and cultural needs, wants and concerns. Just procedures and outcomes are then more likely to follow. Collaboration between various local stakeholders, increases the initiators' understanding of the neighborhood and creates social support which can ideally address structural inequalities by incorporating the socio-economic

and cultural initiative to the needs, wants and concerns of all people. However, it is observed that even though inequalities are acknowledged, they are barely acted upon in the cases of this research. Therefore, recognizing existing inequalities serves as a starting point towards just procedures and outcomes in collaborative urban planning initiatives.

Fourth, following from the previous issues, institutionalization of the three interconnected environmental justice dimensions in CUP is important in the way towards just urban greening. It has become apparent that there is a need for specific attention on environmental justice in CUP, because the extent to which CUP enhances just urban greening is too often dependent on contingencies or the priorities and intentions of initiating stakeholders. Therefore, there is a need for institutionalization, by structural arrangements and policies on environmental justice and climate adaptation in CUP, so that more resources are provided and a broader social and political support is created.

Concluding, collaborative urban planning thus enhances just urban greening outcomes, often through just procedures, including a variety of stakeholders with shared motivation, and somewhat equal access to knowledge and resources between stakeholders, which increase and ensures quality (preservation). This enhances just outcomes mostly in terms of social wellbeing and to a smaller extent in terms of heat reduction, in a more indirect way by increasing awareness and inspiring others to initiate a greening initiative. Just outcomes are especially enhanced when the initiative is citizens initiated, in close collaboration with various public and private stakeholders who specifically attribute attention to just procedures and outcomes and address structural inequalities. However, this specific attention often lacks and there is a need for recognition of existing inequalities and institutionalization of environmental justice in collaborative urban planning so that these inequalities are addressed and just procedures and outcomes are enhanced more. Therefore, collaborative urban planning has the potential to steer us towards just urban greening when it adopts a holistic climate just approach.

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APPENDIX A: LIST OF INTERVIEWEES

INTERVIEWEE	DATE INTERVIEW	ROLE
ZBT-P01	11-03-2021	Project leader DGS
ZBT-P02	30-03-2021	Board member garden association
ZBT-P03	30-03-2021	Gardener
ZBT-PO4	01-04-2021	Initiator real estate company
ZBT-P05	07-04-2021	Civil servant
ZBT-P06	14-04-2021	Gardener
ZBT-P07	11-05-2021	Social organization gardener
LZP-P01	04-03-2021	Project leader DGS
LZP-P02	05-03-2021	Resident
LZP-P03	31-03-2021	Social organization and resident
LZP-P04	07-04-2021	Civil servant
LZP-P05	18-05-2021	Social organization and resident
HEP-PO1	06-05-2021	Civil servant
HEP-P02	06-05-2021	Researcher and former gardener
HEP-P03	09-05-2021	Gardener
HEP-P04	09-05-2021	Gardener
HEP-P05	09-05-2021	Initiator and head-gardener
HEP-P06	21-05-2021	active resident (sometimes gardener)
HEP-P07	11-06-2021	*Regiegroep* member

INTERVIEW QUESTIONS RESIDENTS, GARDENERS AND LOCAL ORGANIZATIONS

Can you (briefly) introduce yourself and tell us something about this initiative, your current role and how long why you have been involved in this?

In what ways do you think this initiative is tackling climate change? Do you use it for this? (e.g. trees, shade, water)
→ What about heat reduction?

Do you feel the need to 'escape' from your home on a hot day and if so, where do you go?
→ Would this (future) green area be a place you would visit?

What activities in general, and by you in particular, take place here?

What is the main reason you visit this place?
→ (e.g. relaxation, stress relief, social meeting place)

In what ways were/are you involved in the decision-making process, outcome and use of the initiative?

Why do you feel motivated to participate and cooperate in this initiative and what contributed to it?

How did you and your neighbors know about the planning and execution of the initiative and were expectations and opportunities for collaboration clearly communicated?
→ How can this be improved?

How have the needs, wants and concerns of you and your neighbors been identified and addressed?

How does the initiative fit in with the neighborhood?
→ What about socio-economic and cultural aspects?

In your opinion, has the project been successful overall? Have there been any unintended effects or unexpected outcomes (positive or negative)?

Is there anything else you would like to mention that we haven't discussed and anyone else you think I should speak to?

INTERVIEW QUESTIONS INITIATORS AND CIVIL SERVANTS

Can you (briefly) introduce yourself and tell us something about this initiative, your current role and how long why you have been involved in this?

In what ways do you think this project is trying to tackle climate change?
→ In your opinion, did the project go as planned in this regard?
→ What about the heat reduction?
→ Would there have been greening here without this initiative?

What do you think are the main effects of this initiative in terms of residents' well-being?
→ (e.g. relaxation, stress relief, social meeting place)

Who were all involved in the initiative and in what ways has the initiative tried to involve a wide range of stakeholders throughout the initiative?
→ Were you able to get everyone involved?
→ Are there people or parties not involved or who could have been involved more?
→ What do you think was the reason for this?

Are there ways the project tries to keep everyone involved and committed/
→If so, how?

How were the knowledge, available resources (time, money, etcetera) and existing relationships of the parties involved used?
→How is this reflected in the results of the initiative?
→Have certain arrangements been made for this?
→How has this influenced the approach?

How did the initiative try to consider the aspects of the neighborhood?
→social, economic and cultural aspects

In what ways did the initiative recognize different stakeholder needs, wants or concerns?
→ Were there ways this was particularly challenging? How has this been dealt with?
→ What about socio-economic and cultural needs, wants and concerns?

In your opinion, has the project been successful overall? Have there been any unintended effects or unexpected outcomes (positive or negative)?
Is there anything else you would like to mention that we have not discussed and anyone else you think I should speak to?

Utrecht University   **INFORMED CONSENT FORM** for participation in:

Towards Just Urban Greening. Developing a Diagnostic Framework for Collaborative Urban Planning as a Means for Just Urban Greening Initiatives in Amsterdam - A Case Study Approach

To be completed by the participant:

I confirm that:
- I am satisfied with the received information about the research;
- I have been given opportunity to ask questions about the research and that any questions that have been risen have been answered satisfactorily;
- I had the opportunity to think carefully about participating in the study;
- I will give an honest answer to the questions asked.

I agree that:
- the data to be collected will be obtained and stored for scientific purposes;
- the collected, completely anonymous, research data can be shared and re-used by scientists to answer other research questions;
- video and/or audio recordings may also be used for scientific purposes.

I understand that:
- I have the right to withdraw my consent to use the data;
- I have the right to see the research report afterwards.

Name of participant: _____

Signature: _____   Date, place: ___ / ___ / ____, _____

To be completed by the investigator:	Name:	**Marijn Kallenberg**
I declare that I have explained the above mentioned participant what participation means and the reasons for data collection. I guarantee the privacy of the data.	Date: Signature:	___ / ___ / _____(dd/mm/yyyy)

PROJECT INFORMATION GRADUATION INTERNSHIP
Towards just urban greening: collaborative urban planning as a means for just urban greening projects in Amsterdam

I would like to invite you to participate in my research. Before deciding to participate, it is important to understand why the research is being conducted and what it would mean for you. Feel free to ask questions if something is unclear or for more information.

WHO AM I AND WHAT IS THIS STUDY ABOUT?
I am Marijn Kallenberg, 24 years old, born and raised in Amsterdam and a master student in Sustainable Development at the University of Utrecht. I am doing this research as a master thesis for my graduation internship at De Gezonde Stad. With this research I want to contribute to inclusive and accessible urban green for all Amsterdammers. This research is about green initiatives in Amsterdam and climate justice. By means of various case studies, I want to investigate how you can make the city greener in a just way, through collaborative greening initiatives. I want to make the mechanisms of the initiatives measurable in order to contribute to making these and future initiatives more climate fair, so that everyone can enjoy greenery in the neighborhood.

WHAT DOES IT MEAN TO PARTICIPATE?
By participating in this research, you contribute even more than you already did to a climate-justice and green city. I would like to learn more about the green initiative to which you have contributed now or in the past through an interview. The interview can take place online or on location. In the latter case, the corona measures are taken into account. The interview will, if you agree, be recorded for research purposes.

WHY ARE YOU INVITED TO PARTICIPATE?
I have invited you to participate because I think you will be a valuable addition to this research for your contribution to a greening initiative in Amsterdam. Participation is completely voluntary and you have the right to decline to participate, to decline any question and to withdraw at any time without consequence.

IS THE PARTICIPATION CONFIDENTIAL?
Yes, to ensure the confidentiality and anonymity of the participant and all persons discussed, I will treat all information in strict confidence, which is collected and kept locked as part of the investigation process. These are kept on my locked laptop and only shared after your approval. You have the right to access the information you have provided at any time.

WHAT HAPPENS WITH THE RESULT OF THE RESEARCH?
The result of the research will be used internally by The Healthy City for the further development of projects. In addition, it will be shared with other parties that contributed to the research and presented to the University of Utrecht.

WHO CAN YOU CONTACT FOR MORE INFORMATION?
For questions you can reach me at any time by e-mail (marijn@degezondestad.org), telephone (06 24 74 70 34) or Linked in. Thank you very much for your participation!

- Distribution
    - Heat stress
        - Trees (present to provide shade)
        - Waterpoint (present)
        - Serves to escape heat during hot days
        - Inspires more green spaces
    - Wellbeing
        - Relaxation
        - Stress relieve
        - Social meeting place
        - Learn about green
        - Physical health
        - Attachment to neighborhood
        - Quality
    - Other environmental distributional effects
- Procedures
    - Principled engagement
        - In/exclusion of voices
        - Stakeholders
        - Initiated by..
        - Discovery
        - Definition
        - Deliberation
        - Determination
    - Shared motivation
        - Legitimacy
        - Trust
        - Mutual understanding
        - Commitment
        - Pride
    - Capacity for joint action
        - Procedural and institutional arrangements
            - Interorganizational arrangements
            - Intraorganizational arrangements
        - Leadership roles
        - Knowledge and resources
- Recognition
    - Socio-economic needs, wants and concerns
    - Cultural needs, wants and concerns
    - Identity differences
        - Acknowledgement
        - Anticipation
    - Feeling welcome

FIGURE 16 AGE GROUPS AMSTERDAM (ALLECIJFERS,2021A)

FIGURE 17 AGE GROUPS BUURT 8 (ALLECIJFERS, 2021B)

FIGURE 18 AGE GROUPS SPORTHELDENBUURT (ALLECIJFERS,2021C)

FIGURE 19 AGE GROUPS BORGERBUURT (ALLECIJFERS, 2021D)

FIGURE 20 REASONS FOR IMPORTANCE OF GREEN (DE GEZONDE STAD, 2020B)

FIGURE 21 PREFERRED GREEN PER TYPE (DE GEZONDE STAD, 2020B)

FIGURE 22 WIND HINDER SOLUTIONS (DE GEZONDE STAD, 2020B)

FIGURE 23 WHAT PEOPLE WOULD LIKE TO DO ON A GREEN LZP (DE GEZEONDE STAD, 2020B)

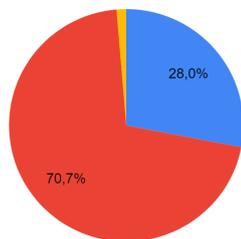FIGURE 24 IMPORTANCE OF GREEN ON LZP (DE GEZONDE STAD, 2020B)

FIGURE 25 INTEREST CITIZENS TO MAINTAIN GREEN ON LZP (DE GEZONDE STAD, 2020B)